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ARTICLE I.

AN ARTICLE ON MALIGNANT DIPHTHERIA, WITH REPORT OF ELEVEN CASES.

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Read before the Fox River Valley Medical Association, at Geneva, Illinois, Jan. 2, 1865.

MR. PRESIDENT, AND GENTLEMEN OF THE FOX RIVER VALLEY MEDICAL ASSOCIATION:

I most respectfully ask your indulgence for a few moments, while I read the following brief history of cases of Diphtheria that have come under my observation since our last meeting.

I do not offer them expecting to present anything new or novel, either in theory or practice. I simply offer them for the purpose of adding my mite to the general record of the medical profession upon this subject, hoping thereby to induce such discussion as shall eventually produce a correct pathology and successful treatment of this terrible disorder.

CASE I.—Mrs. B., a stout, robust German lady, of bilious temperament, and previous good health, aged 23 years, married, and mother of one child aged 14 months, was attacked with chills, followed by fever and sore throat, about the 12th of August, 1864. At first, she resorted to the usual domestic remedies, but failing to obtain relief, called Dr. ——, her usual medical attendant. He attended her for several days, when,

for some reason, she became dissatisfied with him and sent for me. I first visited her on the 19th of the month, and found her with considerable fever, small, rapid pulse, and extreme prostration. There was quite a good deal of swelling externally about the angles of the jaw, face, and neck. Upon inspecting the throat and mouth, I found the tonsils swollen and inflamed, and the left one and a large portion of the roof of the mouth, upon the left side, thickly covered with diphtheritic exudation. There was but little fetor, much less than I had usually found in these cases. The membrane was peculiarly tough, and closely adherent. The swelling of the tonsils was so extensive as to materially interfere with respiration and deglutition. She was very much prostrated, and seemed greatly alarmed concerning herself.

I removed as much of the exudation as I could conveniently, and then applied freely, with a surgeon's camel-hair brush, a saturated solution of nitrate of silver. I ordered her to steam her throat often and thoroughly with the fumes of strong vinegar and sage; also, to rub the skin externally freely with kerosene, and then apply a thin slice of salt pork. I left her quiniæ sulph. grs. xxx, Doveri pulv. grs. xv, divided into six powders, and gave one every four hours; also, 20 drops of the muriated tincture of iron every four hours. Made a strong solution of nutgalls and alum to use as a gargle.

August 20.—Mrs. B. no better; had spent a poor night. She looked and felt very bad. Some fever. Pulse 120, small, and quick; swelling about neck and face increasing, respiration labored, deglutition difficult and painful, exudation abundant and tenacious. Immediately in front of the left tonsil, extending up to and around the uvula was a deep, ragged, bad-looking ulcer. I again removed as much of the membrane as I could conveniently, then cauterized the ulcer thoroughly with the solid stick of nitrate of silver, and advised a continuance of the steaming and garling. Continued the other treatment.

Aug. 21, 9 *o'clock A.M.*—Patient looked bad. She said she was worse, and could not live long. She and her friends were greatly alarmed concerning her condition. External

swelling about the same. The kerosene and salt pork had produced a free eruption. Respiration still labored, deglutition very difficult and painful. When she attempted to swallow, a portion of the fluids were rejected through the nose. Pulse 123, and feeble, swelling of tonsils extreme, and both covered with exudation. The ulcer, spoken of at last visit, was about the same. She complained of being very tired and prostrate. Touched the ulcer again with the nitrate of silver, and continued all the other medicines. In consequence of her extreme prostration, I ordered her to have two table-spoonsful of bourbon whiskey every four hours.

Aug. 22*d*, 9 *o'clock A.M.*—Mrs. B. looked and felt much better. She had slept pretty well during the night, and felt more hopeful. Swelling about face and neck less, respiration and deglutition improving, pulse 118, slower and fuller, exudation not so profuse nor tenacious, no fetor, exudation peeled off quite easily in large flakes or chunks; the surface below was pale blue, and bled when touched; ulcer about the same, no deeper. Dissolved two drachms of kreosote in half an ounce of 95 per cent alcohol, and then washed the throat thoroughly with that mixture. Continued the other treatment, except substituting warm poultices for the salt pork, and advised the crowding of chicken broth, and other nourishment.

Aug. 23*d*, 10 *o'clock A.M.*—Patient improving in all respects except swallowing and talking. She had considerable pain when she swallowed, and a portion of the fluids were still rejected through the nose. She had also lost the power of articulation, and it was with the greatest difficulty that she could make us understand her wants. Throat looked much better, exudation disappearing, and ulcer healing. Again washed the throat with the kreosote mixture, and continued the other treatment as at last visit.

Aug. 24*th*, 10 *o'clock A.M.*—Mrs. B. improving rapidly in every respect except talking. Swelling was disappearing, and she swallowed better. Appetite improving, bowels regular, pulse 94, soft and fuller. Continued treatment.

Aug. 25*th*, 10 *o'clock A.M.*—Mrs. B. bolstered up in bed,

feeling finely. Swelling and exudation had pretty much disappeared, articulation improving, but still very imperfect. Advised a continuance of the muriated tincture of iron and bourbon whiskey in reduced quantities and at longer intervals, for several days, and left her. Sept. 28th, her husband called at my office, *paid his bill*, and said she was doing nicely, all but talking, and that was improving. Oct. 15th, I met her at one of her neighbors, and she was quite fleshed up, and looked well. Her articulation was still very imperfect. From her friends I learn that her speech at this date is not fully restored, but improving.

Case II.—*August 30th*, 1864, was called to see Willie W., a stout, fleshy German boy, aged six years, of good constitution and previous good health, who was attacked with chills on the day previous, and had some fever, and considerable swelling about the angles of the jaw, face, and neck. He complained a great deal of stiffness and soreness in the muscles of the neck and throat. Upon examining his mouth and throat, I found the tonsils largely swollen, and they and a portion of the roof of the mouth well covered with diphtheritic exudation. He had no appetite, and he said it pained him when he swallowed. Pulse 100 per minute, and quick, bowels had moved that morning, skin dry and hot, considerable thirst. I left him quiniæ sulph. grs. xv, pulvis Doveri, grs. v, divided into five powders, one to be given every four hours; also, 10 drops of muriated tincture of iron every four hours; steam the throat freely and frequently with the fumes of sour vinegar and sage, rub the skin about the angles of the jaw and the neck well with kerosene, and apply a thin slice of salt pork about the neck.

Aug. 31st, 11 *o'clock A.M.*—Willie no better. His mother said that he had passed an uneasy, restless night. He had not had any recurrence of chills since the first day. Fever subsiding a little, skin slightly moist, pulse 110 and very quick, swelling externally extending; the kerosene and pork have irritated the skin considerably, he had considerable difficulty in swallowing, tonsils and uvula well enveloped in exudation, very little fetor. Continued all the treatment of the previous day, and ordered an addition of a tablespoonful of bourbon whiskey every four hours.

Sept. 1*st*, 10 *o'clock A.M.*—Willie is decidedly better in all respects. Rested well last night, and sweat freely; swelling and exudation disappearing rapidly. Advised a continuance of the remedies for a few days longer, and discharged him.

CASE III.—*Sept.* 6*th*, 1864, was called to Nancy W., a stout, healthy looking girl, a sister to Willie, aged nine years, also of good constitution and previous good health, who had been complaining for several days. Yesterday she had a chill, which was followed with fever and sore throat. She had considerable swelling about the angles of the jaw, face, and neck, some fever, skin hot and dry, pulse 100, and quick, and also complained of stiffness and soreness in the muscles of the neck and throat. Upon examination, I found the tonsils swollen, fauces inflamed and covered with diphtheritic exudation. There was more fetor in her case than in the others. I left her quiniæ sulph. grs. xv, Doveri pulv. grs. vj, divided into five powders, with directions that one be taken every four hours; also ten drops of muriated tincture of iron in a tablespoonful of bourbon whiskey every four hours, steam the throat well and frequently with the fumes of strong vinegar and sage, and apply externally the kerosene and salt pork.

Willie was up and around, but very weak.

Sept. 7*th*, 11 *o'clock A.M.*—Nancy decidedly better; rested well last night, sweat freely, and was nearly free from fever; swelling decreasing, exudation less, pulse 94, and slower. Continued same treatment.

Sept. 8*th*, 10 *o'clock A.M.*—Improving in all respects; swelling and exudation nearly disappeared. Advised a continuance of the whiskey and iron for a few days longer, and discharged her.

CASE IV.—*October* 31*st*, 1864, was called to see M. H., a stout German boy, aged nine years, of good constitution and previous good health, and a cousin to the above-reported patients. His parents informed me that he had been very healthy and well up to Sunday, the day previous to my visit, when he first began to be indisposed. They said that he had attended the funeral of an older brother on Saturday, got slightly wet,

and on Sunday complained of being chilly, headache, and sore throat. I found him with high fever, dry skin, swelled face and neck, and difficulty in swallowing, pulse 100 and quick, no appetite. Upon inspecting the mouth and throat, I found the tonsils swelled and inflamed, and studded with points of diphtheritic exudation; no fetor. Complained of a good deal of stiffness and soreness in the muscles of the neck and throat. I left him quiniæ sulph. grs. xv, Doveri pulv. grs. vj, divided into five powders, and ordered one to be given every four hours; also fifteen drops of the muriated tincture of iron every four hours, steam the throat thoroughly with fumes of strong vinegar and sage, and externally apply the kerosene and salt pork.

Nov. 1*st*, 9 *o'clock A.M.*—Patient no better. The swelling externally had increased decidedly, respiration labored, deglutition quite difficult, tonsils and uvula completely covered with exudation, pulse 110, quick but weaker. Washed the throat with the kreosote mixture, and continued the other treatment, adding a tablespoonful of bourbon whiskey every two hours.

Nov. 2*d*, 10 *o'clock A.M.*—No better; all the symptoms seemed aggravated. Swelling extensive, the mouth and throat literally filled with dirty-looking exudation, respiration and deglutition difficult, no fetor, skin cool, pulse 120 per minute, quick and feeble. He had taken everything but the whiskey, and had such an aversion to it that they could not get him to take it at all. Removed as much of the exudation as I could. The surface below the membrane looked blue, and bled freely, in consequence of which I made a solution of the persulphate of iron, and washed the throat freely with it. Continued the other treatment, and added fifteen drops of the syrup of the iodide of iron once in four hours, in place of the whiskey.

Nov. 3*d*, 10 *o'clock A.M.*—M. alive, but failing. Neck, face, and throat enormously swollen, respiration very difficult, deglutition almost impossible, a large portion of all fluids are rejected through the naries, roof of mouth, tonsils, uvula, and fauces thickly covered with ragged, filthy-looking membrane, no fetor. The patient had a peculiar, *sallow, lifeless, tallowy look.* Skin cool and dry. When he coughs or strangles, he

throws up large pieces or chunks of membrane and flesh. Pulse 125 per minute, quick, and very feeble. They had attempted to give him the whiskey, but it strangled him, and they had to desist. I advised them to wrap him up in warm flannels, and make him as comfortable as circumstances would admit.

Nov. 4th, 10 *o'clock A.M.*—M. died last night, about 11 o'clock.

CASE V.—*November 2d.*—Had my attention called to Levi, a brother of M., aged 5 years, of good constitution, and previous good health, who had been complaining for several days; had a chill that morning, and had considerable fever and complained of sore throat. Pulse rapid; skin dry and hot. Upon examining the mouth and throat, I found his tonsils swollen and inflamed, but no exudation. I left him quiniæ sulph. grs. xij, Doveri pulvis, grs. iij, divided into six powders; one to be given every four hours. Also, ten drops of muriated tincture of iron every four hours. Ordered them to steam his throat freely with the fumes of strong vinegar and sage. Applied the kerosene and salt pork to the neck.

November 3d, 10 *o'clock A.M.*—Levi about the same. There was rather more swelling about the face and neck, and he now complained of stiffness and soreness of the muscles of the neck and throat. The tonsils were studded with points of exudation; no fetor. Brushed his tonsils and throat with a solution of the persulphate of iron; continued the other treatment, and added a tablespoonful of bourbon whiskey every two hours.

November 4th, 10 *o'clock A.M.*—Levi not so well; passed a bad night; I think probably he had been neglected somewhat in consequence of his brother's dying, and the friends having been engaged with him. The swelling about his face and neck had increased; respiration labored; deglutition difficult and painful; tonsils and roof of mouth well covered with membrane. Pulse, 115 per minute, and quick; skin cool, but dry; no fetor. Continued treatment.

November 5th, 10 *o'clock A.M.*—Levi about the same; swelling full as much; pulse 125, quick and feeble; respiration labored; deglutition very painful; exudation profuse, and began

to peel off in large pieces; no fetor. The surface where the exudation peeled off looked pale and blue, and bleeds upon the slightest touch; he complained of being very tired; skin cool, and he began to have that pale, sallow, lifeless, tallowy look and expression. He had a great aversion to food, and it required great efforts to get him to take the broths or nourishment. Continued all the former treatment, and added fifteen drops of the syrup of iodine of iron every four hours.

November 6th, 10 *o'clock A.M.*—Levi better. There was less swelling and less exudation; pulse 110 per minute, and fuller; respiration improving; sleeps a great deal; bowels regular. Continued treatment.

November 7th, 10 *o'clock A.M.*—Levi improving slowly; he looked pale and prostrate; swelling subsiding; exudation decreasing; throat looks pale and flabby; pulse 108; sleeps most of his time; skin cool; bowels regular; washed his throat with the kreosote mixture, and continued other treatment.

Nov. 8th, 10 *o'clock A.M.*—Levi improving in all respects. Continued treatment.

November 9th, 10 *o'clock A.M.*—Levi doing well; swelling and exudation decreasing; appetite improving a little; still dull and sleepy; skin warmer, and better color; kerosene and pork have blistered the skin from ear to ear; applied a poultice and continued other treatment.

November 10th.—Being absent from the city, my friend, Dr. Woodworth, visited Levi for me; he thought him not quite so well; he was thoroughly covered with a peculiar erythematous redness simulating scarlatina rash, so much so that the Doctor apprehended it scarlatina supervening. There was an increased swelling of the tonsils, with redness of the fauces and uvula; there was also a small point of exudation upon the left tonsil, which he touched with the solid nitrate of silver; in consequence of the scarlatina-like appearance, the Doctor ordered him a warm bath, after which he be well rubbed all over with fresh lard; he also recommended that he have the dilute hydrochloric acid. Continued the stimulus and iron.

November 11th, 10 *o'clock A.M.*—Levi had a little more fever

than when I saw him last, on the 9th; the redness spoken of by Dr. Woodworth had pretty much disappeared; there was a little more swelling and redness of the tonsils and fauces; no exudation; still sleepy; continued quinæ, iron, and stimulants.

November 12*th*, 10 *o'clock A.M.*—I think Levi improving, but very slowly; he presented a little more color and lifelike appearance; he was very prostrate and sleepy; very little swelling; no exudation; had taken his nourishment more willingly; bowels regular; pulse 103; slower and fuller; throat pale and flabby. Continued treatment.

November 15*th*, 10 *o'clock A.M.*—Levi doing well; continued treatment. This patient continued to improve, and finally got about after a very protracted convalescence.

CASE VI.—*November* 7*th*, 1864, was requested to examine Louisa, a fleshy little girl aged one year and four months; sister to M. and Levi, who had been quite fretful and feverish since yesterday; her mother said that she had never been sick since she was born; I found her with some fever and hot, dry skin; rapid pulse and hurried respiration. Upon inspecting the mouth and throat I found the tonsils swollen and red; fauces dry and red; no exudation; eyes suffused and red; bowels loose; wanted to nurse most of the time; prescribed her quinæ sulph. grs. xij, Doveri pulvis, grs. ij, in six powders, one to be given every four hours; also ten drops muriated tincture of iron every four hours; warm fomentation to the throat and neck.

November 8*th*, 10 *o'clock A.M.*—Louisa very bad; tonsils and fauces badly swollen and thickly covered with a peculiarly filthy looking, closely adhering exudation; respiration hurried; deglutition difficult; face and neck swelled; pulse 130; very quick; cross when moved; refused the breast; continued the quinine and muriated tincture; tried to have her swallow some bourbon whiskey, but it strangled her so that we had to desist; advised wine whey instead; this she retained readily; applied the kerosene and salt pork to the throat and neck, in place of the warm fomentations.

November 9*th*, 10 *o'clock A.M.*—Louisa no better; she looked bad, and began to have that same sallow, lifeless, tallowy ap-

pearance; external swelling extensive; she was now having a profuse discharge of a bloody, acrid matter, from the nostrils, which excoriated the upper lip and cheeks; respiration bad; deglutition very difficult; a large portion of fluids attempted to be swallowed were rejected by the nose; skin shiny and cool; pulse 130 per minute, and feeble; tonsils and fauces covered with nasty, ragged-looking exudation; washed the throat with the kreosote mixture, and continued other treatment; urged them to give her all the wine whey and chicken broth she would retain.

November 10th.—Being absent from the city, Dr. Woodworth saw her for me, and reported her failing; he did not deem it advisable to make any change in her treatment.

November 11th, 10 o'clock A.M.—Louisa no better; looked, and was, very bad; did not discover any particular change since my last visit; I think there was greater prostration. Continued same treatment, and added ten drops of the syrup of the iodide of iron every four hours.

November 12th, 10 o'clock A.M.—Louisa looked and appeared a little better; she had had a new and more experienced nurse for a day or two, and had been thoroughly cleansed, washed and changed since my last visit, and, as a consequence, looked and appeared improved. There was not quite as much swelling, and I think she swallows more readily; the exudation was still quite profuse, but peeled off easier. I continued same remedies.

November 13th, 10 o'clock A.M.—Louisa about the same; think she paid more attention to her surroundings; there was not as much exudation; the throat looked pale and flabby; brushed it with the persulphate of iron, and continued same treatment.

November 14th, 10 o'clock A.M.—Louisa not so well; her nurse left yesterday, and things had returned to their old status. There was no increase of swelling nor exudation; she was sinking from exhaustion; there was a good deal of capillary congestion, with coldness of the extremities and surface; pulse barely perceptable at the wrist; put her into a warm bath and then wrapped her up in hot, dry flannels; substituted the whiskey for the wine. Continued the quinine, iron, and broths.

November 15*th*.—Louisa died last night at 10 o'clock.

CASE VII.—*November* 17*th*, 1864, was called to see David, a brother to Levi and Louisa, aged 11 years, also of good constitution and previous good health. He was taken with a chill in the night, and now had high fever, quick pulse, dry skin, with severe headache; he also complained of stiffness and soreness of the muscles of the neck and throat; considerable pain when swallowing; tonsils were swelled, and red with patches of exudation. Cauterized his throat freely with nitrate of silver, and left him quinæ sulph. grs. xx, pulvis Doveri, grs. vj, divided into six powders, one to be taken every four hours; also 15 drops of muriated tincture of iron, every four hours, in two tablespoonfuls of bourbon whiskey; steam the throat often and thoroughly with the fumes of strong vinegar and sage; rub the skin well with kerosene, and then apply a thin slice of salt pork about the neck.

November 18*th*, 10 *o'clock A.M.*—David decidedly worse; neck and face badly swollen; skin not so hot, but dry; pulse 110, quick and full; tonsils and fauces thoroughly covered with thick, bad looking and closely adhering exudation; he insisted that his throat had pained him more, and that he had had much more difficulty in swallowing ever since I cauterized it, yesterday; the kerosene and salt pork were bringing out a full eruption about the neck; pulse 120 per minute and very quick; respiration labored; deglutition quite difficult and painful; the exudation was very tough and closely adherent. Washed his throat with the kreosote mixture and continued the other treatment.

November 19*th*, 10 *o'clock A.M.*—David no better. Looked and felt bad that morning. Had that same sallow, sad, lifeless, tallowy look, skin was dusky and shining, similar to what we frequently see in low forms of pyemia, neck and face badly swollen, respiration quick and labored, deglutition difficult and painful, mouth and throat full of membrane, which could be peeled off quite readily in large flakes or pieces. The membrane had a peculiar dark and disorganized appearance, was very brittle. No fetor. Pulse 130, quick and feeble. The throat, where the membrane

peeled off, was of a pale blue, and flabby appearance. The tonsils and fauces bled quite freely upon the slightest touch. After removing as much of the exudation as I could conveniently, I washed his throat with the dilute persulphate of iron, ordered two tablespoonfuls of bourbon whiskey every two hours, and continued the other remedies.

November 20th, 10 *o'clock A.M.*—David was covered all over with a peculiar erythematous redness, simulating at least scarlatina rash. He was as red as scarlet. There was no augmentation of heat. Pulse 126, slower and fuller. Swelling about neck and face subsiding—kerosene and pork had blistered him from ear to ear—respiration slower and easier, deglutition less painful, exudation not so profuse, throat and roof of mouth pale, and ragged looking. Washed them with the kreosote mixture, substituted warm poultices for the kerosene and pork, and continued the other treatment.

November 21st, 10 *o'clock A.M.*—David better. Redness disappearing. He looked and appeared decidedly better. Swelling subsiding rapidly, skin cool, soft, and moist. Pulse 100, and fuller. Exudation less, respiration and deglutition improved. He complained of being tired. Added 15 drops of the syrup of iodide of iron; continued treatment.

November 22d.—David improving finely. Redness all gone, skin moist and soft, swelling pretty much gone, no exudation, respiration and deglutition good. Reduced the quantity of whiskey one half, and continued other medicines.

November 24th, 2 *o'clock P.M.*—David doing finely. Bolstered up in bed, enjoying himself. Pulse 96, soft and regular. Appetite improving, bowels regular. I advised a continuance of the medicines in reduced quantities, and at longer intervals, for several days, and left him. I have seen his father frequently since, and learned from him that David finally got up and around, after a very slow and protracted convalescence.

CASE VIII.—*November 12th*, 1864.—Was called to see Betsy H., a medium sized, well developed German girl, aged 16 years, a cousin to the above described patients, who attended the funeral of M——, on the 6th, a cold, rainy day. The services

were held at the house, and she was in the house during the same, and then, in going from the house to the grave, and thence home, she became very cold and wet. She had been quite indisposed ever since. Yesterday she had a hard chill, followed with considerable fever. That morning she complained of headache, and sore throat, so I was sent for. I found her with high fever, flushed countenance, dry skin, stiffness and soreness in the muscles of the neck and throat, and some difficulty in swallowing. Upon inspecting the mouth and throat, I found the tonsils and fauces swollen, red, and covered with minute points of diphtheritic exudation. Pulse 100, quick and full, bowels regular. I washed her throat with the kreosote mixture, and left her quinæ sulph. grs. xxx, Doveri pulvis, grs. x, divided into five powders, and ordered that one be given every three hours; also two tablespoonfuls of bourbon whiskey and twenty drops of muriated tincture of iron every four hours; steam the throat with fumes of strong vinegar and sage, rub the skin about the neck thoroughly with kerosene, and then apply a thin slice of salt pork around the neck. Made her a weak solution of persulphate of iron to use as a gargle.

November 13th, 2 o'clock P.M.—Betsy is better. Her folks are very intelligent, and her mother an excellent nurse, who had followed all the directions to the letter, and, in consequence, her daughter was much better. Swelling about the neck and face less, fever abating, and she had less soreness and stiffness of the muscles of the neck, less difficulty in swallowing. There was an increased amount of exudation, but it was thin, and rubbed off quite readily. Pulse 96 per minute, full and soft. Washed her throat again with the kreosote mixture, and continued the other medicines.

November 14th, 2 o'clock P.M.—Betsy much better. Swelling about face and neck pretty nearly disappeared, swelling and redness of tonsils subsiding rapidly. Pulse 90, soft and full. Advised her to continue the medicines a day or two longer, and discharged her.

Although this patient recovered from the diphtheritic attack so readily, her health has been very poor ever since. She com-

plains of extreme prostration, and great want of energy. Her catamenia have not made their appearance, although two periods have passed since. She looks quite pale and exsanguinated, and is still taking tonics and iron.

Case IX.—*November 18th*, 1864.—Was called to see Willie H——, a stout chunk of a German boy, aged 8 years, a brother to Betsy. He had not had any distinct chill, that they were aware of, but had complained a day or two of stiffness and soreness in the muscles of his neck. To-day, he seemed quite indisposed, and said that he could not swallow. Upon inspecting his mouth and throat, I found the tonsils and uvula swollen, and very red, and the left tonsil was well covered with diphtheritic exudation. Pulse 98, slow and full. Respiration normal, deglutition somewhat difficult and painful, bowels constipated. Washed the throat well with the kreosote mixture, and left him quinæ sulph. grs. xv, Doveri pulvis, grs. v, divided into four powders, one to be given every four hours; also a tablespoonful of bourbon whiskey, and ten drops of muriated tincture of iron, every four hours. Steam the throat well and often with the fumes of strong vinegar and sage, and apply the kerosene and salt pork externally to the neck, and left him a dilute solution of the persulphate of iron to use as a gargle.

November 19th, 3 *o'clock P.M.*—Willie better. There was but little external swelling. The tonsils were enlarged and red, and the left one covered to a considerable extent with exudation. Pulse 92 per minute, soft and full. Skin warm and moist, bowels moved twice since my last visit. He had but little thirst, no appetite, respiration easy, deglutition painful. He still complained of a good deal of soreness and stiffness of the neck. Notwithstanding the apparent mildness of the symptoms in this case, there was great muscular prostration, and much more fetor than in either of the above cases. Washed his throat with the kreosote mixture, and continued the other treatment.

November 20th, 3 *o'clock P.M.*—Willie was decidedly better. Found him bolstered up in a rocking-chair. Swelling and redness of tonsils subsiding, exudation mostly disappeared, no fever,

appetite improving, bowels regular, skin soft, warm, and moist. Pulse 76, full and soft. Advised a continuance of the medicines in reduced quantities, and at longer intervals, for a few days more, and discharged him. This patient, notwithstanding the mildness of his attack, had a slow and protracted convalescence.

CASE X.—*November 22d*, 1864.—Was called to see Ellen, a stout, healthy looking German girl, aged 12 years, and a sister to Betsy and Willie, who had been complaining for several days of soreness and lameness all over her. Last night she had a slight chill, which was followed by fever, headache, and sore throat. I found her with fever, dry hot skin, and slight swelling about the angles of the jaw, face, and neck. Upon examing her throat, I found it inflamed, tonsils swelled, red, and studded with patches of diphtheritic exudation. Pulse 90 per minute, quick and full. Respiration normal, deglutition considerably painful, bowels have not moved in two days. Brushed her throat freely with the kreosote mixture, and left her quinæ sulph. grs. xx, Doveri pulvis, grs. x, divided into five powders, one every four hours; also two tablespoonfuls of bourbon whiskey and fifteen drops muriated tincture of iron every four hours. Steam her throat thoroughly with the fumes of strong vinegar and sage. Also left her a weak solution of persulphate of iron, to use as a gargle. Apply the kerosene and salt pork to the neck.

November 23d, 10 *o'clock A.M.*—Ellen decidedly better. Swelling of face and neck less, no fever, sweat freely last night. Pulse 86 per minute, slower and softer. Skin warm and moist, swelling of tonsils subsiding, exudation nearly disappeared, respiration normal, deglutition easy. Washed the throat with the kreosote mixture, and advised the continuance of the medicines for a day or two longer, and discharged her. This patient made a rapid and perfect recovery.

CASE XI.—*November 10th*, 1864.—Was called to see Mariah, another stout, healthy looking German girl, aged 8 years, of good constitution and previous good health. The mother informed me that this girl had been out several days in succession, husking corn, while the weather was very cold, and that

she had become very cold and thoroughly chilled. At first she complained of a great deal of stiffness of her limbs, and soreness of the muscles all over her. For two days she had had headache, with stiff neck, and difficulty in swallowing. Her mother said that she had not noticed that she had had much fever. Bowels had been regular, and appetite pretty good. She said that she did not think her girl very sick, but thought, as I was passing by, she would call me in and have me see her. Upon inspecting her throat and mouth, I found the tonsils moderately swollen and inflamed, fauces red and dry. Upon the posterior surface of the right tonsil I found a sort of fissure, or ulcer, I should think half an inch long by several lines in breadth, which looked like a sort of indulent ulcer, and was covered and filled with diphtheritic exudation. There were also several other minute points of exudation surrounding this fissure upon the right tonsil. No fetor. Pulse quiet, and 82 to the minute. I cauterized the ulcer-like looking fissure with the solid nitrate of silver, and ordered that she steam her throat freely with the fumes of strong vinegar and sage, and that she gargle it thoroughly and often with a saturated solution of chlorate of potassa. Applied the kerosene and salt pork, and left her quinæ sulph. grs. xv, Doveri pulvis, grs. vj, divided into five powders, with orders that one be given every four hours.

November 11*th*, 11 *o'clock A.M.*—Found Mariah sitting up in the rocking-chair by the stove, feeling much better. Had slept well during the night, and sweat freely. Throat looked better, ulcered fissure looked cleaner and healthier; cauterized it again, and advised a continuance of the gargle, and occasional steaming. Repeated the quinine and Dover's powders, recommended that she be kept in the house and warm, and discharged her.

November 18*th*, 11 *o'clock A.M.*—Was called again to see Mariah. Found her in bed, face flushed, skin dry and hot, eyes suffused, and face and neck moderately swollen. Her mother informed me that after my last visit she improved, and they thought her entirely well until the day previous, when she began to complain of being chilly, and her head aching. She had been restless all night, and that morning complained of stiffness

and soreness of her neck and throat. Upon inspecting her mouth and throat, I found the left tonsil and a portion of the left side of the roof of the mouth up to, and around, the uvula thickly covered with tough, nasty looking, closely adhering diphtheritic exudation. No fetor, respiration a little hurried, deglutition painful. Pulse 105 per minute, quick and jerking. The right tonsil was but little swelled, and the fissure entirely healed, no exudation upon it. Washed her throat with the kreosote mixture, ordered it steamed with the vinegar and sage, and gargled with a weak solution of the persulphate of iron. Applied the kerosene and salt pork, and left her quinæ sulph. grs. xv, Doveri pulvis, grs. vj, divided into five powders, with orders that she take one every four hours; also 15 drops of muriated tincture of iron in a tablespoonful of bourbon whiskey every four hours.

November 19*th*, 11 *o'clock A.M.*—Mariah no better. Looked and felt bad. Rested but little during the night. Considerable fever. Pulse 115 per minute, quick and irritable. Extensive swelling of the left side of the face and neck, skin dry, hot, and rough. Had considerable thirst, and a portion of the fluids attempted to be swallowed were rejected through the nose. Left side of throat, and posterior portion of left side of mouth were filled with bad looking exudation, which began to peel off a little. No fetor. She complained of feeling very tired and prostrate. No appetite. Removed as much of the exudation as I could, and washed the throat with the kreosote mixture, increased the whiskey to two tablespoonfuls every four hours, and continued the other treatment.

November 20*th*, 11 *o'clock A.M.*—Mariah no better. Swelling externally increasing. Kerosene and pork had caused a free pustulation. Respiration and deglutition difficult and painful in consequence of the extreme swelling. There was less heat of skin, but she began to show that same sallow, lifeless, tallowy appearance. Pulse 130 per minute, quick but feeble. Left tonsil and left side of mouth and throat still badly swollen, and thickly covered with dry, dark looking exudation. The exudation was dark colored and brittle, which peeled off in thick

chunks. No fetor. Surface beneath the exudation pale blue, and bled quite freely. Removed as much of the membrane as I could conveniently, and then washed the throat with the persulphate of iron solution. Ordered the whiskey to be given every two hours, and added fifteen drops of the syrup of iodide of iron every four hours.

November 21st, 11 *o'clock A.M.*—Mariah about the same in all respects. Continued treatment.

November 22d, 11 *o'clock A.M.*—Mariah full as well. I think the swelling has subsided a little, and perhaps she swallowed a little easier. Pulse 132 and feeble; skin cool and blue; not much thirst. Bowels had moved twice since my last visit. Exudation a little diminished, but looked ragged and bad. No fetor. She had a peculiar abhorrence for chicken broth and beef tea, therefore, we had to feed her on milk porridge and gruel. Continued treatment.

November 23d, 11 *o'clock A.M.*—Mariah about the same; she seemed to be holding her own remarkably well. No increase of swelling; exudation less, and I think her throat looked better. The kerosene and pork had blistered her freely, therefore, we omitted them, and applied a warm poultice in their stead. Continued the other treatment.

Nov. 24th, 11 *o'clock A.M.*—Mariah looked and felt better; slept pretty well during the night; skin warmer and better color; no fever; pulse 128 per minute, and very feeble; respiration and deglutition improving; takes her food more readily; throat looked better; there was still considerable exudation, but it looked better. Continued all the treatment ordered at my last visit.

November 25th, 11 *o'clock A.M.*—Mariah improving; swelling was subsiding rapidly, and she was better in all respects. Continued treatment.

November 26th, 11 *o'clock A.M.*—Mariah still improving nicely. Continued treatment.

November 27th, 2 *o'clock P.M.*—Found Mariah quite comfortable; had rested well, and looked and appeared bright; no fever; skin soft and moist; pulse 98, slow and full; swelling

about the face and neck nearly gone; exudation pretty much disappeared; throat pale, ragged, and flabby; appetite improving; washed the throat with the kreosote mixture; and continued the other treatment.

November 28th, 5 o'clock A.M.—Was summoned to visit Mariah, in haste, whom the messenger said was bleeding profusely from the mouth and nose. When I arrived at her house, I found things in a terrible plight: washdish, bedchamber, sheets, pillows, and towels all covered and saturated with blood. Her parents informed me that she first began to bleed about nine o'clock in the evening. She bled quite profusely from the nose at first, for a while, and then it stopped. Next she voided her urine, and it was mixed with blood; next she went to stool, and passed quite a quantity of blood from the bowels; soon thereafter she vomited, and also threw considerable blood from the stomach. She passed blood from the bladder and bowels several times during the night. The bleeding from the nose and mouth recommenced and continued without interruption until my arrival. The night had been an extremely dark and rainy one; the roads were in an almost impassable condition; and they residing eight miles from the city, did not send for me until daylight in the morning, when I found things as above described.

Mariah was lying among the bloody goods, pulseless at the wrist, very pale, bloodless, and faint. She could not articulate above a whisper, and complained of being very faint. She insisted that she must go to stool, but the least effort to move her, or place her upon the bedpan, would cause her to faint and convulse. I immediately brushed the throat and nostrils with the persulphate of iron, which arrested the bleeding immediately. I had her wrapped up in hot, dry flannels, and tried to crowd the stimulants, but all to no purpose. She grew extremely restless, and sank and died at 1 o'clock P.M.

The blood in the vessels, when I arrived, was in a fluid state. There was no effort at coagulation; it was very thin and dark colored, and remained so. There seemed to be an entire disorganization of the blood, and it oozed from all the mucous

membranes; even the tears from the eyes were mixed with blood, and stained the towels and clothes. This is the only case that I have ever met of such extreme bleeding. I heard of one other, and that occurred in the Spring, in a boy five years old, belonging to the nearest neighbors of this same family. The father of the boy was there, and said that his boy had acted and died very much as this girl had.

REMARKS.—It seems to me there can no longer be any question of its being a constitutional, or blood disease. I regard it as a zymotic disease of an adynamic or asthenic character, whose poison is most acutely debilitating, and seems to destroy or arrest that peculiar stimulus so necessary to excite and perpetuate the various vital phenomena, with a peculiar predisposition to local manifestations. This local manifestation, or exudation, I regard as an adventitious tissue pathognomonic of, and a consequence of the disease. It is most liable to occur in young persons—that period of life when the nutritive function gives a preponderance to the protien constituents of the blood, and inflammations which are so commonly attended with effusions of plastic or albuminous matter occur—hence its predisposition to this peculiar exudation. I say the natural tendency of the age is inclined to plastic effusions or exudations, but the disease in diphtheria has changed the blood so that its products have become aplastic, and, consequently, we have an alkaline and aplastic condition of the system. Is diphtheria a contagious or an infectious disease? This, I regret to say, is still an unsettled question. Leading minds in our profession differ widely upon this point. I have always regarded it as infectious. I am still of that opinion. There is no doubt to my mind but what the disease has been, and can be, communicated under certain circumstances. These circumstances are a continued or oft-repeated exposure in an illy-ventilated apartment where the air is humid, and it and the apartment thoroughly impregnated with the exhalations of the sick. Indeed, it is well known that no circumstance operates more extensively in favoring the speed, or in increasing the virulence and malignancy of all contagious or infectious diseases, than an impure and humid atmos-

phere. Its debilitating influences predispose to zymotic disease. It effects this in two ways. In the first place, it weakens the body, and thus acts as a true predisposing cause. And, in the second place, it leads to the concentration and increased virulence of the poison itself—not only by its general depressing agency, but also by impairing the condition of the blood itself, and by increasing in it the quantity of azotized matter in an incipient stage of corruption, which serves as a convenient nidus for the propagation of the diphtheritic poison. Again, upon the other hand, where the apartments are dry, well-warmed, ventilated, and kept rigidly clean, we have those poisonous emanations and exhalations so diluted and destroyed by the fresh and pure atmosphere that the danger of communicating or contracting the disease is materially lessened. This I deem an important consideration in the management of this disease, and one that well merits the early attention of the medical attendant. I cannot help but think that if this all important hygienic measure was rigidly enforced and thoroughly explained to patients, their friends, and the public, we should largely reduce the percentage of mortality in this disorder.

In all these cases, the predisposing causes must be referred to a morbific poison already present in the system—either accidental or congenital.

I think I have now fully stated my views of its predisposing causes. What the exciting causes are, I think is not so well understood nor clearly demonstrated. Experience has proved them liable to become operative at all times and under almost all circumstances. I have no doubt of their being endemic and extrinsic.

TREATMENT.—Few diseases, I apprehend, have been subjected to as many modes and varieties of treatment as diphtheria. Many prominent and worthy practitioners of medicine regard it as a local disease, requiring local treatment only. This class again divide, and differ widely in the selection of their remedies. Another class, equally prominent, intelligent, and worthy, regard it as a constitutional disease, requiring constitutional treatment. But they too differ equally as much in the selection

of their remedies. This speculation and difference of opinion convinces me that the pathology of the disease is not fully understood, and that, as yet, no certain specifics have been found with which to arrest the disease. My notions are that the first class of the above-named physicians are greatly in error, and must of necessity be unsuccessful in their efforts and practice, so long as they regard and treat it as a local disorder. I fear, also, that many even of those who recognize the disease as a general or constitutional disease, still pay too much regard to the local complication, and treat the consequence more than the disease.

I am not satisfied that my patients have derived much benefit from local applications to the throat in diphtheria. When the local difficulty is excessive, and there is a tendency to, or danger of, sloughing and gangrene, then, of course, we should be on the lookout, and prevent such a result if possible. However, this condition of things I regard as quite unusual and accidental, and to be avoided by other and constitutional means. Of the various remedies recommended and made use of, I have been better satisfied with the effects of the alcoholic solution of kreosote than with any other article that I have used. I think its antiseptic properties recommend it peculiarly to correct the septic tendency of this condition, while its stimulating qualities give tone to the tissues, and prevent them from sloughing. Where the sloughing has already commenced, and the parts are pale, ragged, and flabby, I have used a solution of the persulphate of iron, and have been highly pleased with its effects. It is a powerfully tonic astringent, and as such constringes and hardens the tissues, reduces the swelling, lessens the effusion, and arrests the inflammatory tendency.

Nitrate of silver has not proved of service in my cases. *I am satisfied that severe cauterizations with nitrate of silver, or other caustics, in diphtheria, do more harm than good.* Such has been my experience.

Counter-Irritation.—Notwithstanding the great weight and majority of authorities are against the use of counter-irritants in diphtheria, I am in the habit of resorting to them early,

and am convinced that my patients are benefited by mild and continued counter-irritation about the neck, and over the upper part of the chest. I think they act as revulsives, and detract or divert from the internal local tendency. I have never used cantharides, nor any of the other more powerful vesicating counter-irritants. I think that stimulating liniments and applications are preferable. I have generally made use of kerosene to rub the skin with, and applied a thin slice of bacon or salt pork. They are usually convenient, and generally ready at hand in every house—and I have been well pleased with their action and effects. They are always mild but certain, and I have never known them to prove painful, nor very annoying to the patient. They always produce a free pustular eruption, and I have never known any bad effects to follow their use in diphtheria.

GENERAL OR CONSTITUTIONAL TREATMENT.—What should it consist of? That is the question! Let us examine for a moment what the indications are. What lesion have we to remedy? We have decided that the disease is a blood disease of an undoubted adynamic and asthenic character. Its first decided impression, in all severe and malignant cases, is upon the nervous centres, as is denoted by the general depression of all the vital phenomena of life. Next, we have a poisoned condition of the blood, which is increased as the disease advances, as is shown by the vascular prostration and excitement of the circulation. The rapid, quick pulse indicates that nature is putting forth an extra effort to rid the economy of the poison. In many of the milder cases she succeeds unaided, but in many of the severer and more malignant cases she fails for the want of power. Nature is exhausted. The depressed condition of the nervous system, and the poisoned condition of the blood have absorbed and used up the vital stimuli necessary to excite and perpetuate the animal functions, and the patient sinks and dies from exhaustion—dies for the want of steam and power to propel the machinery of life. Now, what are the indications? What is to be done? How is the catastrophe to be avoided? Most obviously by eliminating the poison and supplying the material for

steam and power. What does that material consist of, and where is it to be sought? I answer among the tonics, stimulants, and nutriments. The next question, then, is what articles of the materia medica offer the greatest inducements? Which contain the greatest number of the above requirements? I cannot think of any one article that offers so great inducements as alcohol and its preparations. It ranks as chief among the general stimulants; under its influence the heart and arteries pulsate more strongly, the capillaries become distended with red blood, the animal temperature is raised, and all the functions, but those of the nervous system in particular, are rendered more active. But the benefits of alcoholic medicines are not limited to their stimulant influence. They are also food, according to the present chemical doctrines, in the sense that they restrict the waste of the body, and therefore indirectly sustain the strength, that is to say, they contain and afford a large quantity of hydrogen, with which the inspired oxygen combines instead of with the tissues themselves. They are also absorbed and enter the blood itself, and are thus carried everywhere through the system to arouse the dormant powers, excite a craving for food, quicken its digestion, promote its assimilation, and thus become, as it were, purveyors to the nutrition of all the organs. Therefore I claim it to be peculiarly adapted to the treatment of these low and malignant cases of diphtheria. Of the many alcoholic preparations, I have preferred and used the bourbon whiskey. I have commenced its use early in the disease, and continued it in large doses for days in succession, as I think, with the happiest results. I think it should be given in quantities sufficient to make and maintain a decided impression on the system. Not sufficient to produce a sedative effect, but enough to stimulate and keep up the functions and hold them firm until the poison can be eliminated and thrown off. It will be noticed that of the eleven cases above reported, nine took whiskey largely through their entire sickness. Eight of the nine recovered. The ninth was improving decidedly and rapidly, when the hemorrhage of which she died occurred. I have every reason to believe that she too would have recovered, had not the hemorrhage occurred.

Two of the eleven took no whiskey, and both died. I do not think that the disease in their cases was any more severe or malignant in its commencement than in the others. Their surroundings also were the same. They all occurred in one neighborhood, covering a space of country two miles in width by six miles in length. Their parents were all prairie farmers. The land is low, and has a clay and loam subsoil. In ordinary, and in wet seasons a considerable portion of the prairie is covered with water; but the past season having been a very dry one in this section, their farms were dry, and they had an unusual growth of vegetation.

Mr. President and Gentlemen, although one of the leading ideas of this article is to suggest the adaptation, and urge the utility of whiskey in diphtheria, I must not be misunderstood as relying upon it alone. I understand too well the qualities and benefits of sulphate of quiniæ, muriated tincture of iron, hydrochlroic acid, and the iodide of iron, in all this class of diseases, to reject them in diphtheria. They are all entitled to our utmost confidence, and should be early and energetically administered in this disease—both as prophylactics and curatives. I say, give plenty of fresh, dry air; bourbon whiskey, largely; quiniæ; muriated tincture of iron; hydrochloric acid; iodide of iron, with the best of nourishment internally; with mild but continued counter-irritation externally; *cleanliness imperative.*

ARTICLE II.

RECENT ADVANCES IN THE SCIENCE OF LIGHT.

By J. S. JEWELL, M.D., Prof. Anatomy in Chicago Medical College.

The advance from a material to a phenominal or wave theory of light, was perhaps the most signal in the history of optics. In this respect the science of light has kept pace with the new views and generalizations which have from time to time prevailed, concerning force and motion. The admission that light

is not a kind of matter but a kind of motion, opened up a new field for, and gave a new direction, to research.

Some of the advances, in the past few years, of our knowledge of the nature and relations of light are so novel and seem to open such a promising field to chemistry and physics, and are likely to prove of such signal practical value to the chemist and physicist, that it may not be improper, in a short article, to collect and exhibit briefly the results of modern research in this direction. In order to do this intelligibly, it will be needful to go back a little and notice the successive steps in the march of discovery. The account I shall subjoin is taken from various sources, as from notices and papers in scientific works, periodicals and foreign reviews, &c.:—

In 1675, NEWTON presented to the Royal Society his memorable treatise on optics. In this paper was detailed his discovery of the solar spectrum, and the singular fact of the compound nature of light, and the colored bands which, in invariable order, traverse the spectrum.

The spectrum was reëxamined by that singularly ingenious experimenter, Dr. WOLLISTON. "It was in 1802, that he, by preventing the overlapping of the colored bands so they should not interfere with each other, discovered that great pecularity in solar light, which in later times has led to such astounding discoveries in the sun itself." He observed when light was passed through a narrow slit and afterwards permitted to fall on the prism, that the spectrum produced was traversed by certain dark bands, of which WOLLISTON counted only seven. The bands seemed as shadows on an otherwise luminous background.

It is, however, to the great German optician, FRAUNHOFER, we are indebted for the first careful examination of these lines. By superior arrangements, he was enabled to discover a far greater number than HOLLASTON had. He counted no less than 500 between the violet and the red, in the spectrum, and in 1815, produced a beautiful map of them. The principal lines he designated by the letters of the alphabet, hence the expression Fraunhofer's line, A, D, &c.

FRAUNHOFER made careful measurements of these lines, and

found them invariably to occupy the same relative position, whether he employed direct solar light, or reflected light from the Moon or Venus. But he observed this singular fact:—In the spectra of the fixed stars, the lines did not coincide with those observed in the solar spectrum. At this early period he reached the conclusion, that the cause for this change in the spectra must be caused by, and reveal some difference in, the constitution of the bodies remitting the light. But the discovery of the wonderful import of these lines was reserved for others.

This branch of science was much advanced by the labors of HERSCHEL, who was able to distinguish some of the metals by their spectra. In 1826, TALBOT, from an examination of certain parts of the spectra of several metals, was led to express an opinion that "if this difference of spectra should be found to be correct, and applicable to the other rays, a glance at the prismatic spectrum of a flame may show it to contain substances which it would otherwise require a laborious chemical analysis to effect." In 1834, he described the spectra of strontium and lithium, and declared his ability, by this means, to detect the minutest portions of these substances.

Prof. STOKES, in his admirable reseaches on fluorescence, showed that similar dark lines exist beyond the violet, requiring special arrangements to render them visible. Some 2000 of these dark lines have been mapped by Sir DAVID BREWSTER and Dr. GLADSTONE, in that part of the spectrum between the red and violet.

This line of research was conducted still farther by Mr. W. H. MILLER, DANIEL and Prof. WHEATSONE. Prof. DRAPER, between the years of 1843 and 1848 published a series of papers on this subject, in which was detailed the results of his own valuable researches.

That both simple and compound bodies may give lines in the spectrum, and that two simple substances which do not singly produce them may in their compounds, and that the vapors of simple substances may exhibit lines while they disappear in their compounds, together with other facts, were shown in 1845, by

W. A. MILLER. FOUCAULT, in 1849, observed when he permitted sunlight to fall on the voltaic ark, and then viewed this compound light through a prism, that the usual double brilliant line of the electric light corresponded exactly with the double black line in solar light, and when they were permitted to overlap the dark solar lines unexpectedly became more distinct as dark lines.

Though these facts, with others of like kind, materially advanced our knowledge of the spectrum, they constitute only the prelude to the most important researches in their bearings on the progress of physical and chemical science which have been made perhaps in modern times.

The Prof. of physics at the University of Heidelberg, taking up the thread where it had been dropped by earlier observers, has been conducted to the most singular and beautiful discoveries.

The labors of MASSON, who examined the spectra of various metals employed as dischargers to Leyden jars, and of AUGSTROM, who showed that from the intense heat of the electric current he was able to discern two spectra—one due to the metal, the other to the atmosphere itself, and of VAN. DER. WILLINGER, and MAXWELL, the latter of whom undertook experiments to determine the wave lengths of different kinds of light, and also of PLUCKER, who examined the spectra of the electric current in rarified gases and vapors, should be considered as contributing to the signal advance in this department of science, in which KIRCHOFF, and his coworker BUNSON, have rendered their names immortal, a short account of which will follow.

The instrument employed by these observers, consisted of several prisms of the finest workmanship, arranged in particular order one after another, by which means they obtain great dispersive power, and were enabled to magnify to a very great extent the primary spectrum, the lines were examined by means of a telescope, several feet distant, magnifying about 40 times, the whole instrument was arranged with admirable precision and revealed spectral phenomena, to the beauty of which there is said to be scarcely a parallel.

The purpose of KIRCHOFF was to measure the absolute and relative width of the dark lines, and intervals between the lines crossing the spectrum; also to determine the depth or range of shade or color, and faithfully to delineate them on a map which he set himself to produce.

In all the respects named, the lines were found to differ in different parts of the spectrum—in width and in intensity of color. The measurements were made by cross wires in the instrument, and with surpassing accuracy. The shades representing the lines were laid on the maps in India ink, with almost infinite trouble, as we may well suppose, when we learn that though years were employed in its construction, it only includes about one-third of the spectrum between the violet and red, and entailed the almost total loss of vision in the indefatigable observer.

But before we shall be able to understand how the solar spectrum can teach us anything of the chemical constitution of the solar atmosphere, we must look in another direction a few moments, and see how the constitution of terrestrial matter can be determined by an examination of the light different kinds of matter, when heated, emits.

That different kinds of matter, when heated, emit light of peculiar kinds, has been long known. This fact has been applied in many ways to pyrotechny; and the tint communicated to the blowpipe flame has been employed as a means of distinguishing substances one from another. This fact, until recently, was known to hold good for only a few substances, but is now known, or believed, to hold good for all elementary substances. This fact is made the basis of one of the most beautiful and useful additions to chemistry, of modern times, viz.: spectrum analysis. This kind of analysis is made independently of the ordinary appliances of chemistry, It only requires that the substance to be examined shall be in a state of luminous gas or vapor, that it may emit its peculiar light. That it is possible to bring all substances into this state is a matter of experiment. The ways in which this is accomplished are various, but for most substances it is only necessary to place a small portion of one

of their readily decomposable compounds in the flame of a spirit lamp or a gas jet. The compound volatilizes, and while in the gaseous state is heated in the flame till luminous. But other means for the metals fused with difficulty, and for the permanent gases, is necessary, and will be alluded to as we proceed.

Now, the fact that the light emitted from various substances is different, cannot usually be perceived by the eye alone. To determine this we must examine their spectra. The same kind of instrument will be required for this, as already referred to, for exhibition of the solar spectrum. There only is it, that each substance writes down the unalterable law of its relations to matter in the brilliant language of the spectrum.

To examine the spectra of all chemical elements, was a work begun several years since by BUNSEN and KIRCHOFF, and the results which they have obtained bid fair to revolutionize, in important respects, analytical chemistry.

All who have paid the slightest attention to qualitative analysis, will remember what a bewildering series of tests, re-agents, solutions, &c., are frequently required to establish the identity of a substance, but in the analysis of their spectra, the case is entirely different.

The instrument being arranged, we place before it the flame of a lamp or burner, and in it place one of the easily decomposable compounds of a metal, say cloride of sodium, and then with the telescope observe the spectrum. In the case supposed we should find a couple of bright yellow lines close together, and the remainder of the spectrum perfectly dark, this is the invariable appearence of sodium, and so minute is the quantity required as to appear incredible, if the delicacy of this test was not shown by experiment. So minute a quantity as the $_{180,000,000,000}$th of a grain will yield the characteristic spectrum. After reading this we will learn without any surprise, it has been found that common salt exists in a finely divided state all through the air. This statement, taken with other collateral ones, suggest some interesting reflections, as to the possible floating contents of the atmosphere. But suppose we introduce into the flame a potassium compound. The flame will instantly acquire a purple tint,

and the spectrum will be observed as a central white portion, bounded at one end by a violet band and at the other by a red band. So too with all the metals, they have their peculiar spectra, invariable under the same conditions, and the person acquainted with their characteristic appearances can instantly recognize them. Of the surpassing beauty of the phenomena of this branch of science, no adequate conception can be formed it is said.

Prof. BUNSEN thus describes what he witnessed when he had placed a mixture of many metals in the flame:—"I took a mixture consisting of the chloride of lithium, chloride of sodium, calcium, strontium, barium, &c., containing at most the $\frac{1}{1000}$th of a grain of each substance. This mixture I placed in the flame and observed the result. First, the intense yellow sodium lines appeared on a background of pale continuous spectrum. As these began to be less distinct, the pale potassium lines were seen, and then the red lithium line came out, whilst the barium lines came out in all their vividness. The sodium, lithium, potassium, and barium salts were now almost volatilized, and after a few moments the strontium and calcium lines came out as from a dissolving view, gradually attaining their characteristic brightness and form."

If the foregoing remarks be true, it will be unnecessary to show what a remarkable service has been done analytical chemistry. But it is not here alone that its utility ends. As a means of discovery, it will probably prove to be the most efficient ever employed.

In examining the spectra of alkalies contained in certain mineral waters obtained at Durckheim, in the Palatinate, he observed some lines not like any he had seen before. Convinced they must be due to the presence of some new element, he began immediately the evaporation of 40 tons of the water. In subsequent examinations he discovered fresh signs of perturbation in the spectrum, and at last was able, from a vast quantity of water to obtain a sufficient amount of two new metals for examination, which he named respectively, cesium and rubidium, the former on account of its bluish gray color, and the

latter because of its dark red color. They are distinguished in their spectra, the one by splendid violet, and the other by deep red lines. Singularly enough neither of these metals can be said to be very rare, especially the latter, which may now be obtained by the pound, and is found copiously in lepidolite. Since that time another new metal has been, by similar means, discovered by Mr. CROOKES. It is called thallium, and the spectrum of which is distinguished by one bright green band. It will be impossible to carry out these facts to their obvious consequences, but it may readily be perceived of what surpassing interest this is to be as a means of discovery, and as the most important acquisition ever made perhaps to analytical chemistry.

When we reflect on the probable future revelations, this line of research is likely to give us, of the intimate constitution of matter, and of light itself, and other correlative phenomena, as exhibited in these relations, we can scarcely be too sanguine in our expectations.

Let us now turn our attention, for a few moments, to another application of the facts above detailed, perhaps the most astonishing of all. FRAUNHOFER, so early as 1815, observed that the two lines now known to be sodium lines corresponded in refrangibility with the two lines in the solar spectrum known as Fraunhofer's line D; and the same fact was observed by BREWSTER, in regard to the correspondence between the potassium lines and the solar lines A. In these two cases, as well as in others, by subsequent observers, there was found to be a complete coincidence between the metallic spectra and certain parts of the solar spectrum except in color.

To test this coincidence, KIRCHOFF performed the following remarkable experiments, and in which we will find the facts which lie at the foundation of solar chemistry:—"In order to test this" says he, "I obtained a tolerable bright solar spectrum, and brought a flame colored by sodium vapor in front of the slit, I then saw the dark lines D change into bright ones. The flame of Bunson's lamp threw the bright sodium lines upon the solar spectrum, with unexpected brilliancy. In order to find out

the extent to which the intensity of the solar spectrum could be increased, without impairing the distinctness of the sodium lines, I allowed the full sunlight to fall through the sodium flame, and to my astonishment I saw that the dark lines D appeared with an extraordinary degree of clearness. I then exchanged the sunlight, for the Drummond or oxyhydrogen lime light, which like that of all incandescent solid and liquid bodies give spectra containing no dark lines. When this light was permitted to fall through a suitable flame colored by common salt, dark lines were seen in the spectrum, in the position of the sodium lines. The same phenomenon was observed if instead of the heated lime, a platinum wire was used, which being heated in a flame was brought to a temperature near the melting point by passing an electric current through it. The phenomenon is easily explained, on the supposition that the sodium flame absorbs rays of the same degree of refrangibility as those it emits while it is transparent to all other rays." Thus he succeeded in producing artificial sunlight, as far as producing one of Fraunhofer's lines is concerned.

Now, several facts are to be noted from these experiments:—

1st. The sodium lines correspond perfectly, except in color, with a certain part of the solar spectrum.

2d. By permitting sunlight to fall through the sodium flame the distinctive color of the sodium lines disappeared entirely, and the dark lines of the solar spectrum alone appeared.

3d. The same result was secured if the Drummond light was employed instead of solar light; and in this way there was a part of its spectrum produced with the utmost exactness, though it is well known, all incandescent, solid and liquid, bodies give spectra without dark lines.

4th. That when light is transmitted through any substance, in a vaporous or gaseous state, while luminous with heat, it absorbs and arrests, that kind of light it emits with a completeness in proportion to its intensity; so that the lines that appear in the spectrum are dark, and, therefore, not characteristically colored.

5th. These dark lines are found to correspond to the dark

lines in that part of the solar spectrum when the rays of the given color are known to be placed relatively from their observed refrangibility.

It thus appears many parts of the solar spectrum may be artificially produced, and in the completest manner; and that we can determine the conditions upon which these facts depend; and if so, may be prepared to explain some of the spectral phenomena of solar light on the same grounds.

The analysis of spectra of the metals has furnished MILSCHELICH some new facts. He finds metals do not yield a spectrum in all their compounds, and that they do not give the same in different compounds. The character of the spectrum was found to depend upon whether it was produced by the metal or one of its compounds of the first order. The compound may have a spectrum different from the metal from which it is derived. He performed some interesting experiments in the way of determining the temperature at which compounds are decomposed, whereby they may yield the characteristic spectra of their elements; and on the facts thus elicited, bases some interesting speculations as to the temperature of the sun or its atmosphere.

We must not omit to mention a law announced by KIRCHOFF, which is denominated the "law of exchange," which asserts that the relation between the amount of heat or of light emitted from all bodies is invariable for the same temperature. A similar result was also arrived at by other observers.

KIRCHOFF now set himself to map the electric spectra of the metals, and, as his guide, chose the dark lines of the solar spectrum, and was surprised to find a complete coincidence between the bright iron lines and certain dark solar lines. Just as the sodium and potassium lines found corresponding lines at D and A, among the lines of the solar spectrum. The utmost pains were taken to verify this. The coincidence was too remarkable to be the effect of chance. Now, the only difference in the spectra was in the *color* of the lines. In order to explain these phenomena, we must now recur to the results of some experiments recorded above. We may suppose the light of the sun, after its emission, to have passed through the vapor of iron in

the solar atmosphere. Now, we have just seen where a flame is colored with sodium vapor, and the lime light was passed through the flame, how the yellow sodium lines became dark, giving exactly the Fraunhofer line D, in the solar spectrum; and just so if we substitute iron for the sodium in the flame, we will have, instead of the red lines in the iron spectrum, dark ones, which now correspond in all particulars with that part of the solar spectrum with which it was first composed. We have, in fact, reproduced part of the solar spectrum, with the utmost fidelity.

Now, the only chance for mistake, in this case, is in this:—that the iron and other metals affecting the solar light may be in our own atmosphere, rather than in the solar atmosphere. But then we do not have the necessary temperature in our own air to vaporize such elements. Then, if this modification of light was made in our own atmosphere, we should expect the light from the stars and the solar light to correspond. They do not, however, correspond nor do the stars always correspond in their spectra. We have not time to examine all the particulars upon which this marvellous conclusion rests; but the evidence, when thoroughly examined, will be found to establish the fact of the existence of iron and many other elementary substances on the sun, as clearly as any fact in physical science. The induction, through which this conclusion has been reached, is eminently satisfactory.

Now, an examination has been undertaken concerning the light of the fixed stars, and we may expect the most novel and interesting results. This branch of science has been styled "solar" or "stellar chemistry," and has now engaged the attention of the first astronomers and physicists, both in Europe and this country. The astronomer royal of England, Prof. AIRY, SECCHI and DONATE on the continent, and RUTHERFORD in this country, are engaged in the exploration of this brilliant path of research. Thus it will be seen, that we have in this new branch of science, the most valuable acquisition ever made to analytical chemistry, and, at the same time, the most efficient means for enlarging the field of chemical and physical science. There is

no greater triumph of science than the key it has given us by which to translate the mysterious though beautiful language of the spectrum; and if anything more is to be revealed of the intimate constitution of matter, or of those singular movements or force of matter known as light, heat, and electricity, and their correlations, it will, in all probability, be through this remarkable way.

ARTICLE III.

DOUBLE PNEUMONIA, WITH CHRONIC BRONCHITIS, CURED BY SUGAR OF LEAD AND SULPHATE OF QUININE.

By G. C. PAOLI, M.D., of Chicago, Ill.

Read before the Chicago Medical Society.

It is a well established usage, in all diseases, to individualize, and I think more especially in inflammation of the lungs, as the following history will substantiate:—

Mrs. C., 32 years of age, whom I was called to see, on the 8th of January, had been moving to her residence, a few days previous, and had been exposed to the cold atmosphere, and was suddenly, on the 6th of January, taken with a chill; also previous to her sudden illness, she had, for several months, been suffering with dyspnœa, when she exerted herself in going up stairs. When I called to see her, late in the night, I found her very weak, short breathed, with an expression of great anxiety, respiration 60, pulse 120, diarrhœa of several days standing, expectoration frothy mucus, sanguinolant appearance; the tongue nearly natural; pain in the cardiac region on pressure; percussion could only, with very great difficulty, be instituted, as the patient was very weak; the anterior, as well as the posterior, parts dull; crepitation audible, on the whole anterior as well as the posterior part; and at the inferior angle of the scapula, bronchous respiration. In the night, I prescribed vinum antimonii, combined with mucilages, to prevent the increase of the diarrhœa. Next morning, when I called early, I found the

patient in a hopeless condition—I can say nearly dying. The extremities cold and bluish, cold sweat over the whole body, a burning thirst, the tongue dry, the pulse small and weak, about 120, respiration hurried, accompanied by mucous rale in trachea, expectoration frothy and rusty.

Although the treatment in this case seemed to me in vain, I still felt that something ought to be done, and I concluded that sugar of lead in this case would be indicated, namely, to diminish somewhat the profuse cold sweat and diarrhœa. To support the strength of the patient, I added sulphate of quinine, namely, quinine, gr. 1, acetas of lead, gr. ½, one powder every other hour.

Jan. 10.—The patient somewhat better, collapse less, the pulse 90, respiration 42, the cold sweat less, but the mucous rale of trachea was still present, the tongue dry and covered, diarrhœa not present during the night.

Jan. 11.—Respiration 44, pulse 104, the cold sweat had disappeared, the tongue humid, clean, desire for food. The patient had rested during the night; the bowels natural; I did not examine her lungs, because she was feeling so weak.

Jan. 12.—Respiration 38, pulse 100, the cough somewhat troublesome, the expectoration purulent, bronchous respiration from the left spina scapula drawn to the base of the lung, and in the right regio-scapularis; on the right anterior surface sonorous rale; hepatization of the lower left and middle lobe of the lung. In order to avoid tediousness in repeating the different symptoms, I will only say, in conclusion, that the patient regained her strength slowly; and that on the 20th, she began to sit up in her bed. It was in this case that I, for the first time, made a chemical examination of the urine. By applying the test, I discovered the absence of chlorides in the first eight days, and on the ninth, the chlorides appeared.

When I take into consideration my patient's critical condition, I must confess, that in this case, sugar of lead saved the patient's life.

It is often very difficult for medical practitioners to give a certain prognosis in acute inflammations of the lungs, and

equally difficult to follow certain rules, which are laid down for the treatment of this disease, because the patient's age, constitution, and complications embarrass us more or less in treatment of inflammation of the lungs.

Selections.

ON THE THERAPEUTIC VALUE OF ALKALINE AND EARTHY SULPHITES IN THE TREATMENT OF CATALYTIC DISEASES.

By DR. H. R. DE RICCI.

[The discovery, if indeed it may be so called, of the action of sulphites in certain forms of catalytic (zymotic) diseases, was made by Dr. Polli of Milan. Since the publication of Dr. Polli's papers on the subject, Dr. De Ricci has devoted much time and attention to its investigation.]

For the benefit of those who may not have read my former publications on the action of the alkaline and earthy sulphites, nor the original writings of Professor Polli, I shall now, as briefly as possible, recount the origin and result of his discoveries.

For several years past, a theory has been almost universally gaining ground that a great number of diseases depend essentially on the presence of an organic poison circulating in the system, where, acting as a ferment in the blood, it multiplies itself, vitiating the animal fluids and giving rise to divers diseases, according to the special poison in circulation; thus in one case producing small-pox, in another scarlatina, in another puerperal fever, &c. These diseases have been termed *zymotic*, on the supposition that the circulating poison acted as a *ferment* in the blood; but, as the precise mode of action of these animal poisons is not as yet well understood (though it is no doubt a chemicovital action), I shall throughout this paper employ the term *catalytic* instead of *zymotic*, as perhaps better calculated to convey the idea of the function of these poisons, without absolutely involving a principal, which the term zymotic might do.

Several years ago, Professor Polli, being fully convinced of the truth of the catalytic theory of many diseases, devoted his talents to search out some means by which these poisons, even

after they were absorbed and developed in the animal economy, might be neutralized, and eventually eliminated, without, at the same time, imperilling the integrity of the blood. The task was an arduous one, for the great physiologist, C. Bernard, had dogmatically asserted, that any substance capable of destroying a catalytic poison in the blood would, at the same time, so alter that fluid itself that it would be rendered incapable of performing its vital functions. Professor Polli, however, had long observed the action of sulphurous acid in arresting the process of fermentation. He was convinced in his own mind that in it would be found the anti-catalytic substance he was seeking for. He persisted in his researches, and eventually succeeded in establishing that not only sulphurous acid possesses the property of arresting fermentation and neutralizing catalytic action, but that also its alkaline and earthy compounds have the same power, with this difference, that while sulphurous acid cannot in any way be introduced into the circulation with safety, the alkaline and earthy sulphites, hyposulthites and bisulphites can be administered with the greatest impunity, even in large doses; and their presence can always be detected when administered, not only in the blood but in the tissues and evacuations. Having satisfactorily established this important fact, he began a series of experiments on animals, which proved, most successfully, the correctness of his theory and the accuracy of his deductions. Nothing could give me greater pleasure than to recount the several interesting experiments which he performed, but it would lengthen this paper too much, and otherwise occupy too much of the space of the Journal; and, for those who are interested in this matter, I beg to refer them to a communication read by me, about a year ago, at the Obstetrical Society in this city, in which will be found a short epitome of Professor Polli's experiments.

From the moment I first read the account of Professor Polli's researches I came to the conclusion that his discovery was either valueless or of immense value. In such a case there could be no medium; it was either utterly worthless, or it was a discovery second to none—a discovery even greater than that of vaccination, and one which would constitute one of the greatest epochs in the annals of medicine; for vaccine could, at most, only ensure the vaccinated against one single disease, while the sulphites—if they truly could neutralize the action of catalytic poisons—of such poisons as *glanders* (see Polli's experiments)—would be able to arrest the course of small-pox, hydrophobia, syphilis, infection from dissecting wounds, erysipelas, puerperal

fever, measles, scarlatina, whooping-cough, dysentry, diarrhœa, cholera, influenza, typhus, dothinenteria, plague, diphtheria, &c., &c., all of which are classed by Dr. Farre as zymotic diseases. The question seemed to me of such vast magnitude and importance that I solicited in every direction for co-operation in testing the real value of these sulphites. I first tried them on myself, and finding them decidedly harmless, even in doses of one scruple, five or six times a day, I began to administer them in every case where I thought that a catalytic poison might be the cause of disease. In no case did I meet with any mishap, and in most cases I think I can fairly say I was successful. In no case did the exhibition of the sulphites produce sickness of stomach, diarrhœa, or any other inconvenience; and in every case their administration seemed to be of decided advantage.

The first case I shall describe is one of great interest and value in a clinical point of view; it was undoubtedly a case of infection from an animal poison. The patient was almost given over as lost, so severe were the symptoms of the disorder; yet the patient recovered, and the treatment consisted solely in the administration of the bisulphite of soda, in full, repeated, and continued doses.

A lady of about forty-five years of age, of sound constitution, and in the enjoyment of excellent health, was suddenly called, about a year ago, to the death-bed of one who was very dear to her. That death-bed was fearfully sudden and unexpected, and that poor lady could not be persuaded, long after death had indubitably taken place, that the spirit of the beloved one had really fled. She would not leave the corpse; she threw herself on it, and kissed it over and over again, and could not be induced to leave it, even when the discoloration of the skin and the offensive smell of rapidly-advancing decomposition gave ample testimony of the reality of death. The burial was performed two days after death, owing to the rapid decomposition of the body; and, soon after the funeral, I was hastily summoned to the bedside of this lady, whom I found in the following condition. It was about five in the morning when I entered the bedroom. She had gone to bed the night before quite calm and resigned, and on the previous day she had partaken fairly of food, but had not eaten any thing which could in any way account for the state in which I found her, of which the following is a fair sketch:—The windows of the bedroom being open, the morning light streamed freely into the room, and as I approached the foot of the bed I had a full view of the patient's face. To those of my readers who, like myself, have been fa-

miliar with the victims of cholera, I shall simply say that the patient looked like one in cholera, in the stage of collapse. To those who have not yet had the melancholy opportunity of witnessing a case of that terrible disease, I shall say that I hardly recognized my friend, so altered, and pinched, and ghastly were her features. Her eyes were sunk, and surrounded by a lead-colored zone; her cheeks, which, but a day before, were plump and ruddy, were now hollow and sunk; her eyes were glassy; her pulse scarcely to be felt; the surface of the body cold; her breath cold; her tongue cold; her voice low and husky; her faculties perfectly clear. She now lay quite prostrate on her back; but for some hours previously had suffered greatly from vomiting, cramps, and diarrhœa, which was of the characteristic rice-water appearance always observed in cholera. I at once administered a full supply of hot brandy and water, ordered turpentine stupes to the abdomen and limbs, treating the case exactly as one of Asiatic cholera; and, being fully alive to the grave nature of the attack, requested for further advice, and at once sent off for my valued friend, the late Dr. Mayne. At first I felt singularly at a loss how to account for so sudden and severe an attack of what seemed to be a genuine case of Asiatic cholera. So true was it to symptoms that, when Dr. Mayne looked at the patient, he whispered to me: "If cholera were in the country one would not hesitate to give this case a name." The clue to the disease was, however, given to me, in a few words, by the patient herself. As soon as she had taken the brandy she said to me:—"The smell of the body was dreadful; I cannot get rid of it in any way;" and immediately she began to retch. She had given me the key, and the mystery of her case was solved. It was no doubt a case of putrid infection—of septicemia; and if there was any truth in the "sulphite" theory it should prove of value in such a case as this. I at once ordered a strong solution of bisulphite of soda in infusion of quassia, with tincture of bitter orange peel and Battley's sedative—two drachms of the bisulphite to the ounce—and give it in large teaspoonful doses, every half hour at first, and then every hour, each dose containing nearly twenty grains of the bisulphite. I watched this case incessantly myself, day and night, and the result was most satisfactory. All the symptoms by degrees abated, and in a very few days the patient was fully convalescent. Dr. Mayne, who had anxiously watched this case with myself, was so impressed with the results obtained that he told me he would give the remedy a full trial in every case of scarlatina that should come under his care; and, in addition,

promised (at my suggestion) that he would prescribe a dose of the sulphites daily to every healthy member of the family in which there was a case of scarlatina, to test its value as a prophylactic; for if a sulphite could destroy a catalytic principle, even when developed in the system, it should also have the power of preventing the development of that principle from the commencement.

As I stated above, the lady recovered, and, apparently, was restored to absolute health; she, however, complained to me occasionally of wandering pain, and general *mal-aise* at times, which she could not account for. About five months after her recovery she hurt her leg; it was a very trifling abrasion, but it assumed an angry look, and seemed determined not to heal, when at the end of two months she broke out all over with an extraordinary eruption, more like erythema-nodosum than anything else, when I at once placed her again on bisulphate of soda, in the supposition that some of the poison was still lurking in her blood, when the sore in her leg rapidly healed and the eruption disappeared, leaving the patient perfectly well.

The next two cases in my list were well-marked types of measles. I shall not take up the time of my readers by giving the details of them. I shall merely state that they were severe cases; that they were treated solely with bisulphite of soda, in scruple doses, every second or third hour, and that both cases grew rapidly well.

The fourth case is one of poisoned wound. A. B., aged about thirty-five, a gardener, was grafting a cactus, and in carelessly handling such a thorny plant, got the back of his left hand severely stung in different places. He plucked out as many of the spines as he could discover, and thought no more about the matter; but in the course of twelve hours or so the hand began to swell and be painful. He at once wrapped it up in a poultice; but the pain and swelling not abating, his employer sent him to me three days after he had been stung. I found his hand enormously swelled, of a dusky purple color, with large bullæ over the dorsum; the forearm also swelled, though not discolored, but presenting several longitudinal red lines running up to the elbow. The man complained of great pain locally, of intense thirst, headache, loss of appetite, shivering, and general feeling of sickness. His tongue was furred and brown. He had, of his own accord, taken a dose of senna and salts that morning. I at once made an incision in the dorsum of the hand, and some pus came out. It was not, however, like cutting into an abscess—no gushing of matter took place, only an oozing,

like as if I had cut into a sponge saturated with pus. I therefore made a second incision, parallel to the first, from which some more pus came out; ordered him to wrap up the hand in a large linseed-meal poultice, and prescribed the bisulphite of soda, in scruple doses, every second hour. I desired the man to keep quiet at home—without, however, ordering him to keep his bed; directed him to take light nutritious food, and to drink two pints of XX porter in the day. The following day the hand looked better; it was less swollen and purple, and the pus was in larger quantity and better looking. The man felt also better; he had less thirst, and had only had two slight shiverings. The bowels not having been freed, I ordered him some sulphur, with magnesia and scammony, as an aperient, and to persist with the bisulphite, taking it now every third hour. The following day the man was so much improved that he called on me. The hand looked still better; the incisions which I had made had ulcerated somewhat round their edges, but the suppuration was free, and the pus seemed quite healthy; there was no pain in the arm, and the red lines were very much paler. Matters looking so very much better, I desired the man to take the sulphite only three times in the twenty-four hours; to take a good allowance of food; to stay much in the open air; but to still keep the arm in a sling, and the hand wrapped in a poultice. Two days later he again came; when, finding that all swelling had subsided, all pain gone, all red lines disappeared, the sore inclined to granulate, I stopped the poultice, and desired him to dress the hand with some warm dressing, containing a little balsam of Peru, and to take one scruple of the bisulphite twice a day. Two days after the man returned to me not looking as well as at the previous visit. He had a yellowish tinge in his skin; his tongue was foul; he complained of chilliness, almost amounting to shivering, and the sore at the back of the hand looked unhealthy and angry. On stripping the arm, the red lines were again visible, but of a very pale red; while above the elbow, from its bend to the axilla, a hard, knotty, and extremely painful cord could be felt and seen running up parallel to the brachial artery. I at once returned to the primary doses of the bisulphite, wrapped up the hand in a poultice, and watched to see what the result would be. The man immediately began to mend, and in four days not a trace of hardness was to be felt. Fearing, however, a relapse, I continued administering four scruples of bisulphite daily for ten days longer, by which time the hand was perfectly healed, and the man returned to his work.

Two better cases for testing the effects of sulphites could not possibly have been selected; in both cases the disease clearly resulted from the working of a poisonous element in the blood, evidently introduced from without in the first case, whilst it may in the second case have originated within the system subsequent to the stinging with the thorns, if one does not feel justified in considering cactus thorns as poisonous of themselves; be this, however, as it may, the second case was as clearly one of purulent absorption as the first was of putrid infection—the red lines up the arm marking the course of the inflamed lymphatics as the hard knotty condition of the veins denoting the phlebitic inflammation. Both were treated solely with sulphites, and both completely recovered. It would be great presumption, no doubt, to say that in both cases the patients would have lost their lives except for the saving properties of the bisulphite of soda administered; but I still cannot avoid believing that the sulphurous acid did prevent the spreading of the catalytic principle by rendering it incapable of reproducing itself; and, while keeping it in abeyance, allowed time for its elimination by the ordinary powers of nature; and I think we have a confirmation of this view in the occurrence of a relapse in both cases, where it would appear as if, when the bisulphite was stopped, all the poison had not yet been eliminated, the blood disease breaking out again the moment that the poison was freed of its antagonist; and a cure being effected by administering more of the anti-catalytic remedy until every trace of the animal poison was eliminated.—*Dublin Quarterly Journal, August*, 1864, *p.* 28.

LETTER FROM DR. W. N. COTE.

SEPTEMBER 9TH, 1864.

ANIMALCULAR ORIGIN OF DISEASE.—In a paper recently addressed to the Academy of Sciences, Drs. Leplard and Jaillard examine whether microzoaria are the real causes of the diseases in which their presence has been ascertained in the human body. You are aware that in their endeavors to explain the origin and propagation of contagious disorders, physicians have often attributed these affections to the existence of invisible animalcules, parasites, or impalpable ferments. This hypothesis was extremely plausible, and received a superstructure of various medical theories, but these had still to be verified, for while it was necessary to prove that there exist cryptogamous

plants and infusoria capable of engendering diseases. Various attempts have been made to solve this important problem, and observers of unquestionable merit, considering all kinds of virus to be ferments, and ferments to be animated beings, have not hesitated to attribute to infusoria the development of carbuncle, typhus fever, and other affections, because they had found such microscopic animalcules in the blood of subjects that had died of these maladies. Our authors are of opinion that such assertions are, at least, premature, and ought to have been supported by more direct evidence than that as yet adduced. Thus, instead of inoculating animals, as some have done, with the blood of subjects laboring under carbuncles, a blood in which the microscope can detect but very few of the elements it contains, they think it more advisable to operate with bacteria free from all accessories, which might either rightly or wrongly be suspected of being the active principles of the disease. Bacteria, as your readers are aware, are infusoria of the genus vibrio; under the microscope they have the appearance of threads, and they are developed in all liquids containing animal matter in a state of decomposition. It is, therefore, very easy to procure these animalcules, and our authors have performed a series of experiments, by injecting liquids containing them into the cellular tissues, and even the veins of rabbits, dogs, and other animals. These experiments show that the introduction of bacteria or vibrios into the blood causes no virulent disorders, although the putrified substances introduced may produce the effects of poison.

International Medical Congress.—I have now before me the draft of the convention proposed by a committee of the International Medical Congress at Geneva, for general adoption, and agreed to, and to which I referred in my preceding letter. I think it well to place it before your readers.

"The undersigned plenipotentiaries assembled in congress at Geneva, have adopted the following arrangements to be observed in case of hostilities breaking out between their respective countries:—

1. Ambulances and military hospitals shall be recognized as neutral, and as such, protected and respected by the belligerents as long as they shall contain sick or wounded.

2. All the sanitary staff, including physicians and surgeons, apothecaries, attendants, officials, and generally all persons attached to the service of hospitals and ambulances, shall be considered neutralized.

3. The above-mentioned persons shall be permitted, even after

occupation by the enemy, to continue to fulfil their duties in the hospital or ambulance to which they are attached, as long as shall be necessary, after which they shall be allowed to depart without being in any way hindered or inconvenienced.

4. These persons, however, shall not be permitted to remove any articles but those which are their own private property. All materials employed in the arrangement of the ambulance or hospital will remain subject to the rights of war.

5. The inhabitants of the country, who may be employed in the transport of the wounded, or in bringing them assistance upon the field of battle, shall be equally respected, and remain entirely free.

6. Soldiers badly wounded, whether already received into the ambulances and hospitals, or whether picked up upon the field, shall not only have there hurts attended to irrespective of their nationality, but shall also not be made prisoners. They may return to their homes, upon condition of not again taking up arms during the course of the campaign.

7. A safe conduct and, if necessary, the costs of the route, shall be handed to soldiers mentioned in the preceding article, when after cure, they leave the place where they have been nursed.

8. Articles requisite for the sick and the persons attached to the ambulance, shall be supplied to the army in occupation, which shall be subsequently repaid the outlay shown to have been incurred, by receipts furnished for the purpose.

9. A distinctive and uniform armlet shall be adopted by the sanitary officials and staff of all armies. An identical flag shall also be employed in all countries, to distinguish ambulances and military hospitals. The armlet and flag shall be those agreed upon by the International Conference which met at Geneva in 1863, (a red cross upon a white ground.)

10. Those persons, who, without being entitled to wear the armlet, shall adopt it to enable them to act as spies, shall be punished with the full rigor of military law.

11. Similar stipulations to the preceding, relative to naval warfare, shall form the object of a further convention between interested powers.

Oxygen and Ozone.—M. St. Edme publishes certain experiments, from which it appears that oxygen separated by the electrolytic process from a binary compound is not ozonized, and that this state only manifests itself when the decomposing power of electricity has been brought to bear on a double chemical affinity. M. St. Edme is consequently inclined to suppose

that ozone is but a different dynamic state of oxygen, and not a chemical or physical transformation.—*Med. & Surg. Reporter.*

TREATMENT OF ACUTE ORCHITIS BY PUNCTURING THE TESTICLE.

Henry Smith, Esq., Assistant-Surgeon King's College Hospital, in a case of very acute gonorrhœal orchitis, supposing supperation had taken place, with a view of evacuating the pus, made a free incision; but, to his dismay, no matter escaped. Speedy relief, however, followeed, and this case suggested some serious reflections. The quantity of serum and blood abstracted was too small, for the cessation of pain and swelling could hardly be due to this cause, and he was led to ascribe the relief to the removal of tension by the division of the fibrous envelope of the testis.

"Influenced," he says "by this reasoning, and by the result of this case, I determined to try the effect of puncturing the testis in similar cases; and in the next case of acute orchitis which presented, I made a deep and free incision with a sharp narrow bistoury, emitting about half a teaspoonful of serum and several drachms of blood; and no other treatment, beyond a little of the common aperient mixture, was supplied. The result here was as successful as in the former; and as cases presented themselves, I adopted the same plan of treatment, reserving it, however, especially to those instances where the swelling and pain were very great. After the trial in a few cases, it was found that the success attending this practice was such as to lead me to adopt it as the usual treatment of acute orchitis; and during the last twelve months I have probably treated in this way upwards of twenty cases, with results as have astonished both myself and those numerous pupils who have witnessed the practice.

"In nearly every case so treated—and I have purposely selected the most acute—the patient has experienced the most striking relief before he has left the out-patient's room; and on the next visit, forty-eight hours afterwards, the contrast presented is so remarkable that the superiority of this plan over the old-fashioned modes of treatment is at once impressed forcibly upon the minds of those even who would naturally be prejudiced against so apparently heroic a treatment. The speedy subsidence of all the acute symptons is due entirely to the puncture of the swollen and inflamed organ, for I have taken especial care

not to prescribe anything else except a little of the common white mixture, or perhaps the use of the ordinary lead lotion, and this chiefly to please the patient.

"The only inconvenient result," he states, "I have witnessed from this treatment, was the following: An incision was made into the testicles of a middle aged man, with the usual relief, but in a few days the scrotum began to swell, great pain was experienced, and the man was taken into the hospital. The objectors to the mode of treatment suggested all sorts of disasters, in the shape of suppuration of the testicle, &c., but on careful examination it was ascertained that the swelling consisted of a large and rapid effusion of fluid into the tunica vaginalis, which was at once evacuated, with speedy relief to the patient. In another instance I made the incision much deeper than was necessary, carrying the point of the knife nearly to the back of the organ.

As much as ten ounces of blood was lost, but the testis was violently inflamed and swollen, and the only effect of the accident was to make the patient somewhat faint, but at the same time to give more speedy and effectual relief than usual.

"This circumstance may lead one to the belief that the relief is due solely to the escape of blood from the puncture; bnt this view is inconsistent with the fact that great relief is given when only a few drachms of blood, mixed with serum, are discharged. Doubtless the direct withdrawal of blood from the highly inflamed testicle is of service, but my own view of the matter is, that the relief is in a great measure due to the withdrawal of the tension from the body of the testis by free division of the tunica albuginea."

In a postscript, Mr. S. adds:—"Since the above was written I have seen one of my old pupils who has been spending the last six months in the Paris hospitals, and he informs me that the ordinary practice at the Hopital de Midi, in cases of acute orchitis, is to make a puncture in several places with a lancet; the instrument is not carried into the body of the testicle, but simply through the tunica albuginea. He describes the plan of treatment as most successful."—*Amer. Jour. Med. Science, from the Lancet, Aug.* 6, 1864.

EFFECTS OF THE EXCESSIVE USE OF SUGAR ON THE SYSTEM.

Dr. Champouillon communicated the result of his observations on the excessive use of sugar on the system. So far back as

the year 1846, the author undertook a series of experiments on himself, in order to supply the Minister of War with information as to the possibility of replacing salt by sugar in the preparation of the preserved meat destined for the use of the army during a campaign. In accordance with his instructions, M. Champouillon strictly confined himself to the diet which may be accidentally enforced on the garrison of a besieged city by the hardships of war, and for several days in sucession lived on the following rations: sixteen ounces of beef preserved in sugar, and four ounces of biscuit; water was his only beverage. Various phenomena supervened in the following order: thirst, sinking at the stomach, distaste for food, nausea, acid regurgitation, epigastric pain, diarrhœa, prostration, and syncope.

"I carefully watched these symptoms," says M. Champouillon, "and the loss of appetite and nausea indubitably proceeded from the absence of variety in my diet; whereas the thirst, heartburn, epigastric pain and diarrhœa were as clearly referable to the difficulty of digesting cane-sugar. In proportion to the impression produced by this substance on the organs of taste, it clogs the palate and destroys natural appetite. This excessive indulgence in syrups, sweet-meats, pastries, and highly-sweetened diet-drinks, brings on distaste for food, and annihilates the digestive powers, especially in cases of pulmonary consumption." After expatiating on the transformation of sugar-cane into glucose, in consequence of its contact with the acids contained in the gastric juice, and on the injury caused by the increased activity imparted to the functions of the stomach by frequent repetition of the process, M. Champuillon showed that in addition to the inflammatory congestion thus occasioned, glucose powerfully contributes to the establishment of a plethoric condition of the system, and that the prevalent opinion, that the excessive use of sugar tends to cause pulmonary irritation and a disposition to atrophy, is but too well justified by facts. In support of this view, the author adduced two interesting cases, one of apoplexy, the other of hæmoptysis, in which the agency of this cause was distinctly evident.

"I have often remarked," said he, "in thirty-three years' experience of tubercular disease, that the cough, hectic fever, and night-sweats are increased by the fondness of the patients for sweet substances. I conceive this to be the natural consequence of the combustion of the glucose in the system, a phenomenon which necessarily implies the production of water, carbonic acid and heat. It is a well-known fact that three and a half ounces of sugar consumed in the human body evolve an

amount of heat equivalent to what might be produced by the combustion of thirty-two grains of charcoal. MM. Favrot and Silberman have shown that fifteen grains of charcoal are sufficient to impart one degree (cent.) of heat to eight kilogrammes or sixteen pounds of water. If the capacity of the human body for caloric is the same as that of water, three ounces and a-half of sugar will, in a subject weighing seventy-five kilogrammes (12½ st.), raise during their combustion the temperature of the body four degrees and a-half (centigr)."

The practical conclusion of this paper is, that it is desirable to reduce within as narrow limits as possible the consumption of sugar, especially in cases of tuberculosis, and to replace that substance by honey, or a decoction of liquorice.—*Dublin Med. Press, Feb.* 24, 1864, *from Journ. de Med. et Chirurg.*

ON THE CONDITION OF THE STOMACH AND INTESTINES IN SCARLATINA.

By Dr. SAMUEL FENWICK, late Lecturer on Pathological Anatomy at the Newcastle-on-Tyne College of Medicine, in connection with the University of Durham.

The object of this paper is to prove the following propositions:

1st. That the mucous membrane of the œsophagus, stomach, and intestines is inflamed in scarlatina.

2d. That desquamation of the epithelium of these parts takes place.

3d. That notwithstanding the anatomical changes in the mucous membrane of the stomach, the formation of pepsine is not prevented.

4th. That the condition of the skin is similar to the condition of the mucous membrane in scarlatina.

In support of the first proposition, the microscopic examinations of the mucous membranes of the œsophagus, stomach, and intestines were detailed in ten cases of death from scarlatina during the first week of illness, and in six cases who died in the second and third week of the fever. The first effects of the scarlatina poison upon the mucous membrane of the stomach were shown to be the congestion of the bloodvessels, and the stripping of the epithelium from the tubes and the surface of the organ, and also the softening of the tissues. The tubes are greatly distended by granular and fatty matters, or by small cells intermixed with granules, and in some cases they are lined

by a newly-formed membrane. Sometimes no normal cells can be distinguished; in other cases they are present, but are scattered irregularly. After the second or third week the tubes are found less distended than at an earlier period, and whilst their closed ends are still loaded with granular matters, which greatly obscure the gastric cells, these become more evident towards the surface of the mucous membrane. The cells at this period are sometimes very large, sometimes loaded with fat or coated with granules, and seem to have but little adhesion to their basement membrane, as they readily separate from the tubes, but adhere closely to each other. The effects of the inflammation upon the intestines seem, in slighter cases, to consist in the effusion of granular and fatty matters into the mucous membrane; but in more severe cases the tubes of Lieberkühn are obstructed by epithelial cells, whilst extravasations of blood take place in the villi, and these with the rest of the mucous membrane, are loaded with small cells and granules. In one case the mucous membranes was entirely stripped of villi, excepting a few fragments which still remained, and the enlarged and prominent opening of the follicles of Lieberkühn gave its surface the appearance of a sieve. In some instances in which the pancreas has been examined, evidences of disease presented themselves.

The second proposition was stated to be more difficult of proof, inasmuch as vomiting usually occurs only in the first stage, and the author had no opportunity of examining the vomitted matters at this period of the disease. In one case, in which vomiting took place in the third week, fibrinous casts of the stomach tubes were discovered, and inflammation of the mucous membrane was proved to have existed by *post mortem* examination. The chief reason upon which the opinion that desquamation of the epithelium occurs was founded, was from the microscopic examination of the contents of the stomachs of those who had died of this disease. The contents in recent cases consisted of pieces of fine membrane, of cells, and of granules and shreds of membrane. The membranes were of the shape and size of the tubes of the stomach, and were covered with granules and fat. The cells varied from 1-1200th to 1-2200th of an inch, and were usually fringed with fine pieces of membrane. In cases of longer duration the membranes were covered with cells, and were also of the size and shape of the stomach tubes. In order to ascertain if these appearances were trustworthy as evidences of inflammation, the contents of the stomachs of forty-five subjects were examined at the Middlesex

Hospital, the condition of the mucous membrane being at the same time noted. In only one were there any fibrinous casts, and it was in a case of acute gastritis. In eighteen there were only separate cells, chiefly of the columnar form, and in none of these was there any inflammatory action. In eight cases casts of the upper parts of the tubes were plentiful, composed only of healthy conical cells, and in all the mucous membrane was in a natural condition. In eighteen there were either plugs formed of cells and granules from the secreting parts of the tubes, or the casts of conical cells were overlaid with granular matters, and in all of these the stomach was more or less inflamed. Two cases of gastritis, unconnected with scarlatina, were also quoted as examples of the forms in which casts of the stomach tubes appeared in vomited matters during life, and the author stated he had detected casts of the stomach tubes in matters vomited by persons affected with gastritis connected with diseased kidneys, with inflammatory dyspepsia, and other forms of inflammation of the gastric mucous membrane. It was urged that if casts of the gastric tubes can be discovered during life in cases of gastritis, and if in scarlatina this condition exists, and casts have been found in the stomach after death, there is every probability that desquamation of the epithelium takes place in this organ, as it does in the skin and the kidneys.

In support of the third proposition, the results of the following experiments were given in the three cases of scarlatina:—Ten grains of hard boiled white of egg were digested at a temperature of 90° for twelve hours in an infusion of the mucous membrane, to which three per cent. of hydrochloric acid had been previously added. The average loss of albumen was three grains and two-thirds. Similar experiments performed with the stomachs of eleven males who died of various diseases at the same hospital gave an average loss of four grains; so that there had been scarcely any diminution of pepsine produced by the fever. As a contrast to this were the results of similar experiments upon four cases who died of typhus fever. In two of these the albumen had gained three grains of weight by imbibition, and was not at all softened; whilst in the other two it was softened, and one had lost only half a grain, the other one grain and a-half in weight. But as the activity of the digestion must depend not only upon the relative amount of pespine, but also upon the bulk of the mucous membrane, this was also attempted to be estimated. The average weight of the mucous membrane of the stomachs of ten males dying of various diseases at the Middlesex Hospital was eighteen drachms, the weight of two

recent cases of scarlatina was eighteen and sixteen drachms (the latter being in a boy), whilst it only amounted to fifteen drachms in one who died in the third week of illness. In four cases of typhoid fever the average weight of the mucous membrane only reached eleven drachms.

Under the fourth proposition, it was stated that the skin had only been examined microscopically in three cases. In the first, in which the patient died after a few days' illness, the only morbid appearance in the cutis was an occasional minute extravasation of blood in the neighborhood of the sudoriferous ducts. The rete mucosum was greatly thickened, and numerous round cells with large nuclei were everywhere visible, intermixed with the natural cells. The basement membranes of the sweat-glands were thickened, and the epithelium lining them was so much increased that in most cases it obstructed their channels. In some of the sweat-glands the coils of which they were composed were loaded with coagulated blood, and were greatly and irregularly distended. In the other recent case the appearances were similar, excepting that the external layers of the cuticle were stained with blood in minute patches, and the sweat-ducts were also reddened; but there were no extravasations of blood either in the glands or cutis. In some of the ducts the epithelium was detached from the basement membranes. In the case of a man who died during the third week, the sudoriferous tubes were still choked up, but in the glands the epithelium seemed in many places to be torn away, leaving the basement membranes bare, or only covered by ragged particles. The cutis was in a natural condition.

The author stated that although he had, in accordance with the usual custom, described the appearance of the skin and mucous membranes as the results of inflammation, yet that certain considerations suggested the idea that the term when so used was perhaps misapplied. In scarlatina, we find that in each part the morbid condition is mostly confined, in the first instance, to the basement membranes, and consists in the formation of layers of new cells, which, in the skin, are transformed into cuticle of natural appearance, and in the stomach contain pepsine. If future researches should prove that a similar condition occurs in the kidneys and other parts, it will be necessary to look upon the structural changes produced as resulting from increased physiological, rather than pathological action; and that the primary effect of the scarlatina poison is suddenly and violently to stimulate the natural cell-growth of the various secreting organs.—*Lancet, July* 23, 1864, *p.* 93.

ON THE TREATMENT OF FEVER.

By DR. GULL, Physician to Guy's Hospital..

[The following short extract from some editorial remarks made by Dr. Gull, is contained in the "Reports of Hospital Practice" in the Medical Times and Gazette. When the pulse in the early stage of typhus or typhoid is very frequent, the patient requires to be well supported, in order to carry him through the later stages of the fever.]

Dr. Gull proceeded to remark: I do not believe in giving enormous doses of brandy in fever. My experience is against that system. I am sure of this, that if you have a severe case of typhus, and the patient is likely to die, no amount of brandy will save him.

Another part of the treatment that requires your attention is this: when I am called in to see a case of fever, I am not unfrequently told that the patient has been given something every half hour. In one case they said every five minutes. The plan of continually feeding Dr. Gull very strongly condemned; further saying, it is a very doubtful question in my mind whether much, or if any, of the nourishment given in severe cases is assimilated. But there is another way to support the patient; keep him cool, sponge his skin over three or four times a-day, give him plenty of liquids, to support the renal respiration, and plenty of fresh air to support the pulmonary respiration.—*Med. Times and Gazette, Aug.* 20, 1864, *p.* 196.

Book Notices.

A Treatise on Military Surgery and Hygiene. By Frank Hastings Hamilton, M.D., late Lieutenant-Colonel, Medical Inspector U.S.A.; Professor of Military Surgery and Hygiene, and of Fractures and Dislocations in Bellevue Medical College; Surgeon to Bellevue Hospital; Professor of Military Surgery, &c., in Long Island College Hospital; author of "Treatise on Fractures and Dislocations," and of a "Practical Treatise on Military Surgery." Illustrated with 127 Engravings. New York: Bailliere Brothers, 520 Broadway.

This is a full-sized octavo volume of 648 pages, printed on fair type, good paper, and neatly bound.

The Author is one of the most careful observers and best

writers in the profession. Combining ample experience in the field, the camp, and the hospital, with long study and discipline as a teacher in surgery, we should expect from his pen a work of the highest order of merit.

The general scope of the work will be best indicated by the following table of contents:—

Chapter 1. Introduction. *Chap.* 2. Examination of Recruits. *Chap.* 3. General Hygiene of Troops. *Chap.* 4. Bivouac, Accommodation of Troops in Tents, Barracks, Billets, Huts, &c. *Chap.* 5. Hospitals. *Chap.* 6. Preparations for the Field. *Chap.* 7. Hygienic Management of Troops upon the March. *Chap.* 8. Conveyance of Sick and Wounded Soldiers. *Chap.* 9. Gun-Shot Wounds. *Chap.* 10. Gun-Shot Injuries of the Head. *Chap.* 11. Gun-Shot Injuries of the Face and Neck. *Chap.* 12. Gun-Shot Injuries of the Thorax. *Chap.* 13. Fractured and Incised Wounds of the Thorax. *Chap.* 14. Gun-Shot Wounds of the Abdomen. *Chap.* 15. Punctured and Incised Wounds of the Abdomen. *Chap.* 16. Gun-Shot Wounds of the Male Organs of Generation. *Chap.* 17. Gun-Shot Fractures. *Chap.* 18. Amputations. *Chap.* 19. Exsections. *Chap.* 20. Arrow Wounds. *Chap.* 21. Traumatic Gangrene. *Chap.* 22. Hospital Gangrene. *Chap.* 23. Dry Gangrene. *Chap.* 24. Tetanus. *Chap.* 25. Scorbutus. *Chap.* 26. On the Employment of Anæsthetics in Major Amputations, and in other Severe Surgical Operations, after Gun-Shot Injuries. Appendix.

Such are the subjects treated in the work before us. From the brief examination we have been able to make, we do not hesitate to recommend it as the best work on Military Surgery and Hygihne, now accessible to the profession, in this country.

We would especially commend the Hygienic part of the work.

Braithwaite's Retrospect of Practical Medicine and Surgery. Part I. January, 1865. Uniform American Edition. New York: W. A. Townsend, 55 Walker Street.

This well-known semi-annual publication is still promptly issued; and the contents of the present number are as varied and valuable as those of any that have preceded it.

London Lancet:—This standard representative of English medical literature appears promptly every month, from the Republication Office, 109 Nassau Street, New York.

Editorial.

Mortality of Chicago for Jan. 1865.—The following table shows the mortality of Chicago for the month of January, 1865, as condensed from the Health Officer's report:—

Accidents and Injuries,	6	Epilepsy,	1
Apoplexy or Congestion of Brain	2	Disease of Heart,	1
Inflammation of Brain,	7	Marasmus,	4
Inflammation of Lungs,	9	Burned,	3
Inflammation of Stomach & Bowels	5	Typhoid Fever,	12
Pulmonary Consumption,	35	Typhus Fever,	1
Disease of the Liver,	1	Paralysis,	1
Laryngitis or Croup,	23	Scarlet Fever,	8
Convulsions,	18	Small-Pox,	10
Childbed Fever,	10	Spinal Meningitis,	1
Diphtheria,	5	Sciatica,	1
Dropsy,	10	Old Age,	4
Hydrocephalus,	6	Stillborn,	10
Dysentery,	1	Unknown,	21
Diarrhœa,	7		
Erysipelas,	2	Total,	225

Ages of the Deceased.—Under 5 years, 100; over 5 and under 10 years, 14; over 10 and under 20, 3; over 20 and under 30, 30; over 30 and under 40, 25; over 40 and under 50, 15; over 50 and under 60, 9; over 60 and under 70, 6; over 70 and under 80, 7; over 80 and under 90, 1; stillborn, 10; unknown, 5. Total, 225.

The above table indicates a very healthy condition of the City; the gross mortality being at least 25 per cent less than for the month of January, 1864. This is probably owing to the coëxistence of two circumstances:—

The first is, that the past month (Jan., 1865) has been only moderately cold and dry, with no sudden and extreme atmospheric changes. The second is, that the river and atmosphere of the City have been much less offensive from putrid animal matter than during the corresponding month last year.

Chicago Medical College Commencement.—The Annual

Commencement exercises and conferring of Degrees, in Chicago Medical College, Medical Department of Lind University, will take place on the evening of the first Tuesday in March, 1865. The Valedictory Address will be delivered by Professor J. S. JEWELL.

TRANSACTIONS OF THE AMER. MED. ASSOCIATION FOR 1864.—This volume is now completed and ready for distribution. Our copy was received to-day, and will be duly noticed in the next number of the EXAMINER.

ILLINOIS STATE MEDICAL SOCIETY.—The following is the list of Committees expected to report at the Annual Meeting of the State Medical Society, to be held in Bloomington on the first Tuesday in May, 1865:—

Committee on Practical Medicine and Epidemics: J. Adams Allen, M.D., of Chicago; C. Goodbrake, M.D., of Clinton; H. Noble, M.D., of Hayworth.

Committee on Surgery: D. W. Young, M.D., of Aurora; A. L. McArthur, M.D., of Joliet; L. T. Hewins, M.D., of Oak Alla.

Committee on Obstetrics: W. H. Byford, M.D., of Chicago; Lucius Clark, M.D., of Rockford; S. T. Trowbridge, M.D., of Decatur.

Committee on Drugs and Medicines: John Bartlett, M.D., of Chicago; F. R. Payne, M.D., of Marshall; T. D. Fitch, M.D., of Chicago.

Committee on Ophthalmology: E. L. Holmes, M.D., of Chicago; R. E. McVey, M.D., of Waverly; J. S. Whitmire, M. D., of Metamora; F. B. Haller, M.D., of Vandalia.

Committee on Spotted Fever: J. S. Jewell, M.D., of Chicago.

Committee on Orthopœdic Surgery: David Prince, M.D., of Jacksonville.

The Committee of Arrangements and the Profession in Bloomington are preparing to give the Society a cordial reception, and we trust the coming meeting will be larger and more profitable than any that have preceded it. We hope the committees will have their reports fully prepared.

AMERICAN MEDICAL ASSOCIATION.

The American Medical Association will hold its Sixteenth Annual Meeting in the City of Boston, on Tuesday, June 6th, 1865.

The following Committees are expected to report:—

On Insanity—Dr. H. R. Storer, Mass., Chairman.

On Exsection and its connection with Conservative Surgery —Dr. Lewis A. Sayres, N. Y., Chairman.

On Drainage and Sewerage of Large Cities, and their Influence on Public Health—Dr. W. J. C. Duhamel, D. C., Chairman.

On Alcohol and its Relations to Man—Dr. G. E. Morgan, Maryland, Chairman.

On Quarantine—Dr. Wilson Jewell, Penn., Chairman.

On Medical Ethics—Dr. John A. Murphy, Ohio, Chairman.

On the Microscope—Dr. James M. Corse, Pennsylvania, Chairman.

On the Relations which Electricity sustains to the Causes of Disease—Dr. Squire Littell, Penn., Chairman.

On the Morbid and Therapeutic Effects of Mental and Moral Influences—Dr. A. B. Palmer, Mich., Chairman.

On the Causes of the Extinction of the Aboriginal Races of America—Dr. Geo. V. Suckley, Md., Chairman.

On the Causes and Treatment of Ununited Fractures—Dr. Frank H. Hamilton, N. Y., Chairman.

On Diphtheria—Dr. Lucius Clark, Ill., Chairman.

On the Uses and Abuses of Pessaries—Dr. James P. White, N. Y., Chairman.

On International Medical Ethics—Dr. J. Baxter Upham, Mass., Chairman.

On Climatology and Epidemic Diseases—Dr. C. W. Parsons, R. I., Chairman.

On Autopsies in Relation to Medical Jurisprudence—Dr. T. C. Finnell, N. Y., Chairman.

On so-called Spotted Fever—Dr. James J. Levick, Penn., Chairman.

On the Introduction of Disease by Commerce, and the Means of its Prevention—Dr. A. Nelson Bell, N. Y., Chairman.

On Patent Rights and Medical Men—Dr. David Prince, Ill., Chairman.

On Revision of Plan of Organization—Dr. N. S. Davis, Chairman.

On Specialists—Dr. J. Homberger, N. Y., Chairman.

On Compulsory Vaccination—Dr. A. N. Bell, N. Y., Chairman.

On Rank of Medical Corps in the Army—Dr. C. S. Tripler, U. S. A., Chairman.

On Rank of Medical Corps in the Navy—Dr. T. L. Smith, N. Y., Chairman.

WM. B. ATKINSON, *Permanent Secretary.*

We insert the foregoing notice of the approaching meeting of the Association with much pleasure.

We anticipate such arrangements for the management of the several *Sections*, at the next meeting, as will secure the more thorough and interesting examination and discussion of all papers presented, and the restriction of entertainments, sight-seeing, &c., more nearly within their proper limits. It would be a good plan, therefore, if all who make reports or wish to present volunteer papers, would be ready on the first day, at the morning Session; that appropriate references may be made at once.

It is also extremely desirable that all reports and papers should be *fully prepared*, before presentation, that they may be passed directly from the Sections to the Committee of Publication, (if deemed worthy,) without being left, *perhaps months*, in the hands of their authors, for completion or revision. This would save the Committee of Publication much vexatious delay in the performance of their duties, and ensure a much earlier completion of the annual volume of Transactions. All we hear from the profession in the Middle and Western States, indicates a lively interest in the Meeting to be held in June next.

ARSENIC-EATING IN STYRIA—Dr. Craig Maclagan, in a paper lately read before the Edinburgh Medico-Chirurgical Society, shows that the "arsenic-eating" of Styria is no fable. On a late

visit to Styria, he took occasion to investigate the matter himself; and, with his own eyes, saw one man swallow over four grains of arsenious acid at a dose, without suffering any poisonous symptoms. He afterwards found arsenic in the man's urine. Another man swallowed, in the doctor's presence, six grains of arsenious acid, eating it on bread and butter. "The man stated that he generally takes about the quantity we saw him swallow once a week, but with variations in the intervals, there being sometimes four days only, sometimes eight days, between the dose; that when he has a distance to walk to his work, he takes a larger dose, and is then in good spirits for about eight days; that if he, however, intermit it for fourteen days, he feels stiff in the feet, with general lassitude, and a craving for another dose. If his victuals are hard of digestion, he takes a dose to assist the stomach; and if he takes a rather full dose, he brings a good deal of wind off his stomach, but never vomits. He stated that his father had taken arsenic before him, and in considerable quantity; and that, in the immediate neighborhood of Liegist, numbers use it, several taking it daily, and many in larger doses than he. He said that all who take it are healthy; that he never knew of any one vomiting from its use; and he believed that, like the use of tobacco, if the dose is very gradually diminished, an arsenic-eater can break himself of the habit. —*British Med. Journal.*

TREATMENT OF ONYCHIA.—The disease of which Mr. de Moerloose, of Ghent, effects a cure in a few days by the application of nitrate of lead is not that which is popularly termed the growth of the nail into the flesh, but the fungous, ichorous, unhealthy ulcer, occurring especially in children at the root of the nails, which fall away, leaving a sore with swelled, jagged edges, causing a deformation of the finger or toe, and occasionally requiring amputation.

"Parents," says Mr. de Moerloose, "frequently convey their children to the hospital requesting me to cut off the diseased finger. This I have never consented to do, and I may add that I have always succeeded in effecting a rapid cure. A week or ten days in general, or at the farthest three or four weeks, have always been sufficient for the purpose, even under the most unfavorable circumstances. The remedy I resort to is the application, after the excision of any irregular horny excressences, of powdered nitrate of lead. The wound should be dressed once a day only; the pain promptly subsides, the swelling soon decreases, the secretion resumes a healthy character, and, in the course of five or six days, the sore is often thoroughly cleansed."

Mr. Wardrop, who refers the disease to syphilis, recommends mercury to be employed so as to affect the gums in about a fortnight (*a*); but although the affection may occasionally in the adult be traced to this cause, it is frequently met with in hospitals for infancy, where it appears more obviously connected with a scrofulous condition of the system, and much more rapidly yields to the very simple treatment above described than to any other medication.—*Med. and Surg. Rep.*

Respiration after Decapitation.—It appears that respiration to some extent can take place even after decapitation. A clever physiologist, M. Faivre, having some years ago made certain delicate experiments on the breathing of insects, came to the conclusion that in insects as well as in mammalia, the breathing faculty has its seat in some particular region of the nervous system, this region being the metathoracic or central ganglion. Another physiologist, M. Bandelot, a few days ago sent in a paper to the Academy of Science, in which he endeavored to show that M. Faivre was entirely wrong, and that the metathoracic ganglion was quite innocent of any action whatever in the breathing process. As to M. Bandelot's arguments it is feared that they can only be defended on the principle that the end jnstifies the means—for in order to ascertain this point in physiology, he tells us he took a caterpillar, the larva of a *libellula*, and summarily cut off its head; after which operation, the larva was good natured enough to continue breathing for twenty-four hours longer. Thus M. Bandelot had the satisfaction of ascertaining that the cerebral lobes have nothing to do with breathing, although some people are likely to object that the larva must have found it more inconvenient to breathe *with* a head than *without* one. But our author not being yet satisfied, took another larva, cut it right across through the middle, and discovered to his intense satisfaction, that the subject could breathe even without a metathoracic ganglion! Whether the larva was equally delighted is to be doubted, for M. Bandelot does admit there was some slight irregularity in the breathing.—*Med. and Surg. Rep.*

Treatment of Asthma.—It is almost impossible to lay down general rules applicable to the treatment of every case of asthma, because remedies efficacious in one instance prove injurious in another. We alluded in our last number to nitrated leaves and preparations of lobelia. The following is a prescription which Prof. Trousseau has often found serviceable when other remedies have failed:—

℞. Potassii iodidi, ℥ij.; Aquæ destil, ℥v.

The dose is one teaspoonful every day before dinner when dyspnœa persists after the cessation of the more violent paroxysms. This medicine facilitates expectoration and restores the freedom of respiration.—*Jour. Prac. Med. and Surg.*

Regeneration of Bone.—In a biographical sketch of Prof. J. R. Wood, N. Y., (in the *Med. & Surg. Rep.*) Dr. Francis states that Dr. Wood has reproduced almost every bone in the body by treating with profound respect the periosteum. His museum contains all the experiments on the human patient that were practiced on birds and quadrupeds by Duhamel and Flourens.

Obituary.—Wm. Senhouse Kirkes, M.D., died Dec. 8, 1864, of double pneumonia, with pericarditis, after an illness of five days. Dr. Kirkes was physician to St. Bartholomew's Hospital, and well known in this country as an author of an excellent hand-book on Physiology. His age was 41.

ARTIFICIAL LEGS FOR SOLDIERS.

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DR. MOTT ON ARTIFICIAL LEGS.

New York, February 10, 1860.

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Third. The joints, instead of being bushed with buckskin, which requires a renewal at the hands of the maker, when worn, are adjustable, and under the control of the wearer.

Fourth. The springs are made of India-rubber, and imitate more closely the action of the muscles.

Fifth. The action of the springs can be increased or diminished at the option of the wearer, whereby each can adjust the motions of the leg to suit his own peculiar gait.

VALENTINE MOTT, M.D.
Emeritus Prof. of Surgery and Surgical Anatomy in the University of New York.